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Making the Market Grow

How the Metal Trades Can Prepare the Ground
for Increased Sales Volume—Duties of Sales
Research and Promotion Departments

HOW can we get more business? . . . What new uses can be developed for our products? . . . Where can we locate prospects who do not know what we manufacture?

These and similar questions are constantly before the sales executive but often he is so concerned with immediate orders that he has no time for an adequate answer. Frequently the information on which correct solutions of these problems must be based does not exist and must be laboriously compiled.

As a result, these important questions—the answers to which are potentially quite as profitable as the solution of production problems—are either unanswered or else left to some subordinate, often untrained and with no clear understanding of the factors involved.

Sometimes the work of preparing sales statistics concerning present and past volume in specific lines, territorial distribution, competitive distribution, etc., is delegated to a clerk in the sales department. Perhaps the duties are considered sufficiently important to require the designation of a separate department or division. Accordingly a "sales promotion" or "sales research" department is inaugurated.

Routine Work Hampers Real Research

BUT even then the work is sometimes neglected, because such a division becomes the "goat" of other departments and is required to devote time which should be given to legitimate research to such routine details as revision of mailing lists, multigraphing of letters, filing of salesmen's report blanks, etc. Even where the necessity for relieving a research department from routine work is properly appreciated, there is seldom a clear understanding of the functions or duties of such a branch of the sales organization.

Consequently the charts presented here, showing the nature of the sales research and promotion departments in the American Radiator Co. and the Burroughs Adding Machine Co., are of value as showing exactly how some of the successful research departments in the metal-working industries do actually operate. Moreover, an analysis has been made of the duties generally assigned to these two important sales branches by a number of leading industrial manufacturers.*

This analysis shows that the study of sales possibilities may properly include the gathering of statistics relative to production and sales, the responsibility for forecasts and trend reports, the establishment of quotas

where they are feasible, the handling of sales records and the comparison of sales attainments with estimates, the determination of size of territories and the number of men required to cover each, the routing of salesmen and methods of compensating them, a study of salesman turnover, the establishment of standards of selection for hiring salesmen and, finally, the supervision of sales contract forms in accordance with company policies.

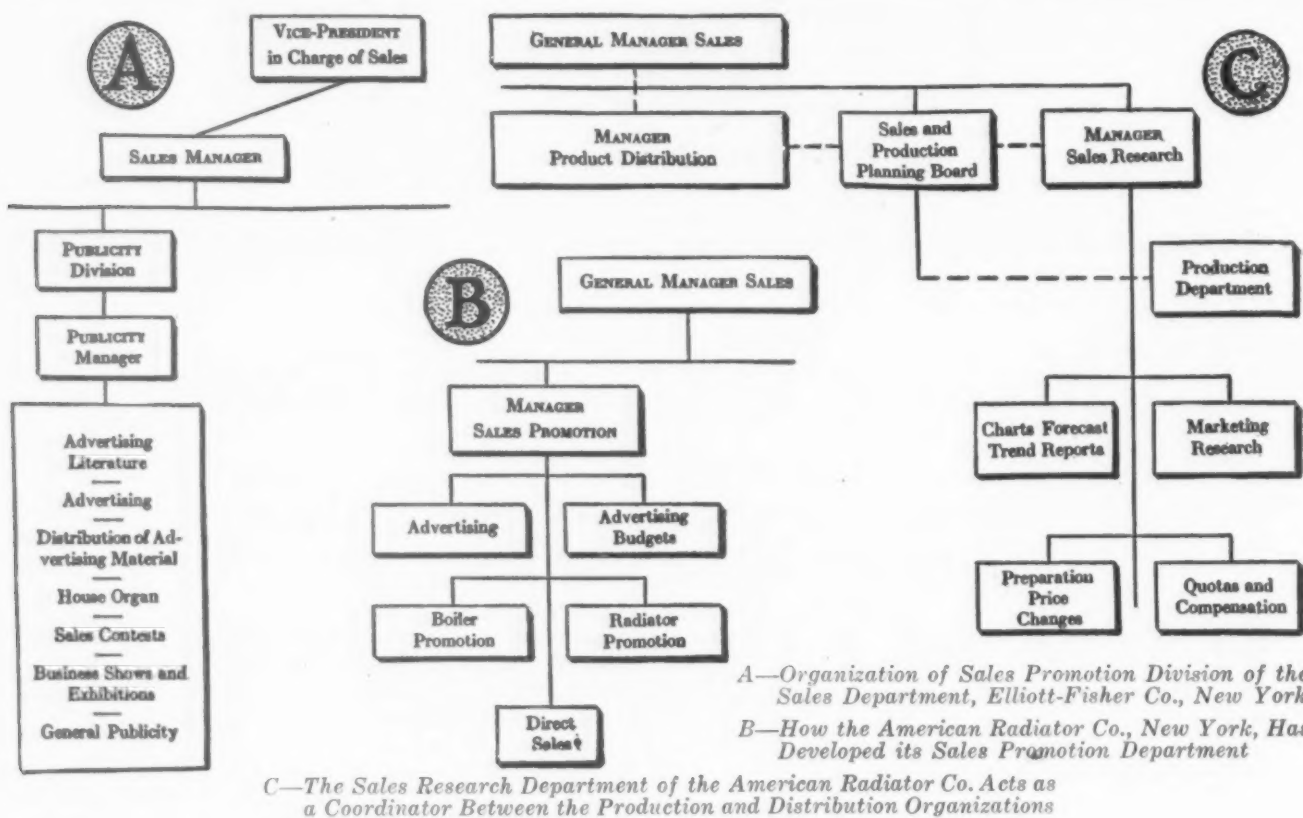
Two Types of Duties

IT will be noted that these duties may readily be classified in two divisions: those which will be more or less continuous, requiring constant study, and those which are "one-time" jobs—requiring concentrated rather than continuous study. In a recent speech before the American Management Association, C. T. Hansen commented on the necessity of taking up only one of the second class of problems at a time. Thus responsibility for forecasts and handling of records may be handled as a part of regular work while the study of sales compensation would constitute a major research to be taken up and finished before another major analysis is undertaken.

It will also be noticed that the functions of this "typical" sales research department (which may, perhaps, more accurately be called "composite") do not include any of the duties generally recognized as coming under the jurisdiction of the sales promotion department. The same analysis includes a composite picture of the duties which may properly be relegated to this part of the sales organization. This department may be labelled "publicity" or "sales engineering" . . . but if it occupies itself with work of a promotional character it will include some or all of the following functions:

Planning and administering sales contests and sales campaigns; devising sales methods, plans and propositions; planning and conducting sales conventions, sales exhibitions and demonstrations; publishing sales bulletins; managing agency conferences; developing standard sales letters; assisting salesmen by placing at their disposal the best work of the publicity or advertising departments; promoting the company's advertising to customers in such a way that they become better prospects for the company's salesmen (in such a classification might be included the work of certain iron and steel companies using national advertising mediums reaching the ultimate consumer, for the purpose of increasing the business of dealers who are the actual customers of the company); assisting in opening new markets and exploiting new uses; developing new pros-

*Taken from the analytic study of sales research organizations prepared by the Metropolitan Life Insurance Co., New York.



pects, and passing on to local branches methods used to hire and train new men.

Promotion Functions Continuous

MOST of the functions of the sales promotion department are, it will be seen, continuous. It may not be advisable to undertake all the listed tasks at once: some of them will be found in practically every sales department, whether the sales promotion division is recognized as such, or not.

Many companies which are not able to afford sales research work of their own can secure much of the good

which would result therefrom by using the results of the various trade associations in the metal-working trades. Practically every such association, aside from the technical groups primarily interested in production problems, carries on some sort of sales research work. The Sheet Steel Trade Extension Committee in Pittsburgh has blazed several new trails for the sheet manufacturers; the American Institute of Steel Construction has shown the fabricators some of the problems which face expansion of their market. The Steel Barrel Manufacturers Institute compiles excellent trade distribution statistics. Many others might be mentioned.

IRON AND STEEL MAKING

Manufacturing Census Shows 1923 Product Above Four Billions

Census figures for 1923 covering the manufacture of iron and steel have just been issued by the Department of Commerce. The pamphlet giving details may be obtained from the Superintendent of Documents, Government Printing Office, Washington, at 5c. The report is divided into two sections—blast furnaces and steel works and rolling mills. It gives comparisons with the census figures of 1921, 1919 and 1914 under each heading. A supplement covers wire as drawn from purchased bars or rods, while tin and terne plate are covered in one table.

Blast furnaces in 169 establishments in 1923 had 41,469 persons engaged, of whom 36,712 were wage earners. Salaries and wages aggregated \$71,212,281, of which \$58,935,384 were wages. The value of products is given as \$1,007,613,340, which is more than double the \$419,771,244 of 1921 and is 27 per cent ahead of the \$794,466,558 of 1919. In 1914 the value, under much lower unit prices, was \$317,653,983.

Steel works and rolling mills, with 489 establishments in 1923, had 428,524 persons engaged, of whom 388,201 were wage earners. Salaries and wages aggregated \$737,879,984, of which \$637,825,137 were wages.

The value of products aggregated \$3,154,324,671, which is more than double the \$1,481,659,352 for 1921. It represents about 12 per cent increase over the \$2,828,902,376 of 1919. In 1914 the total was \$918,664,565.

Wire drawn from purchased bars or rods was made in 64 establishments in 1923, having 21,310 wage earners with wages amounting to \$29,861,860. The value of products was \$196,364,212, of which the cost of materials accounted for \$133,883,057.

Tin plate and **terne plate** in 1923 was made in 810 dipping sets, with daily capacity on single turn of 6,477,700 lb. Of these sets 765, with capacity 5,851,500 lb., were employed usually on tin plate and the remainder on terne plate. The total value of products is given as \$165,587,376, which is lower than the \$180,325,368 of 1919, but much higher than the 1921 figure of \$99,128,817 and the 1914 total of \$68,342,962.

Summary for the iron and steel industry shows 658 establishments with 469,993 persons engaged, of whom 424,913 were wage earners. Salaries and wages amounted to \$809,092,265, of which \$696,760,521 were wages. Total value of products is given as \$4,161,938,011 in 1923; \$1,901,430,596 in 1921; \$3,623,368,934 in 1919 and \$1,236,318,548 in 1914. The value added by manufacture in 1923 was \$1,289,910,108, an amount slightly less than the 1919 total of \$1,321,506,680. In 1921 this figure, which is the measure of the manufacturing effort, was \$535,255,626, and in 1914 it was \$380,912,796.

Electric Steel for Staybolt Use

Material Stronger Than the Time-Honored Staybolt Iron, with Better Ductility—Uniformity and Homogeneous Qualities

BY THOMAS S. WHEELWRIGHT*

BOTH metallurgical and labor considerations are involved in the question of the manufacture of staybolts for locomotive use and of similar material for other uses. It is getting more and more difficult each year to obtain satisfactory puddlers. The work requires men of unusual physique who are willing to labor under exceedingly strenuous and somewhat disagreeable conditions. The heat to which they are subjected drives many men out of the field and others are unable to stand the rigors of this particular type of employment. To produce a high-grade puddled iron requires about 75 per cent of sweat and 25 per cent of brains.

These proportions may be reversed if we make our material in the electric furnace. Here a mixture of 25 per cent of sweat with 75 per cent of brains produces a metal superior to that of the puddling furnace. Since brains are getting cheaper with the increasing numbers being educated, and sweat is getting dearer through restriction of immigration, the line of least resistance lies in the employment of machinery in place of man power.

Locomotive Staybolts

For locomotive staybolts in particular, the railroads must look in the direction of cheaper production, provided, of course, the service life of the material is kept equal to that of the old material or is made better. Our experience, extending over several years, shows that this service life may be improved through an improvement in the homogeneity of the material, an improvement in both its elastic limit and its tensile strength, a considerable gain in its elongation and a still greater gain in the reduction of area on test.

Staybolt iron specifications bear heavily on this question of ductility, and it is in this particular that electric steel most considerably surpasses the qualities of puddled iron. Steel staybolts have been used for the last 15 years by some of the English railroads, but American roads seem to be ultra-conservative in this matter. Among the specifications for fire-box staybolts of the Great Western Railway Co. of England are the following:

Bars to be manufactured from steel made by the acid open-hearth or acid Bessemer process, with carbon from 0.12 to 0.18 per cent and sulphur and phosphorus not to exceed 0.06 per cent. All bars to be rolled and reeled to specified diameters, with a tolerance not exceeding 0.006 in. \pm and round and parallel within limits of 0.002 in. Tensile breaking strength must be 32 to 37 tons (71,680 to 82,880 lb.) per sq. in., with elongation of 28 to 23 per cent in 3 in. Samples must withstand a minimum of 14,000 revolutions under a fiber stress of 27 tons (60,480 lb.) per sq. in., on the Swindon revolving fatigue testing machine. A test piece, 10mm. square, with a V-notch 2mm. deep, at an angle of 45 deg., must record at least 80 ft. lb. on the Izod testing machine. Bars nicked and broken cold must show a silky, fibrous structure, free from crystalline formation.

Staybolts meeting the above specifications are used in certain parts of the fire box for boilers under working steam pressures of 220 and 225 lb. per sq. in. The tensile strength called for is far higher than is customary in this country, but the makers seem to have little difficulty in meeting it.

Cost Is Less Than Iron

Another feature, in connection with the present situation in the United States, lies in the fact that electric staybolt bars can be produced at a cost of about

1c. less per lb. than puddled staybolt iron. As the annual consumption of staybolt iron in the United States is some 50,000 net tons, this saving would represent approximately \$1,000,000 per year.

Observation on an engine of the Atlantic Coast Line Railroad shows the renewal cost considerably lower. This deals with the use of staybolt iron applied to the left side of the fire box and electric steel staybolts, made in the same plant, and applied to the right side. After three years of service, 32 of the iron bolts from the left side had had to be removed and 11 electric steel bolts from the right side.

Tests Show How the Two Metals Compare

Examination of a considerable number of tests, both of the staybolt iron and of electric steel made for this purpose, shows without exception a higher elastic limit and tensile strength in the steel, as well as a greater elongation and reduction of area. In the table will be found a summary of a great many such tests, one group of each material having been tested in 1925 and another group of each material in 1921. The two years show results closely analogous in each case. It will be noted from the table that the slight reduction in strength figures in the electric steel, compared with the earlier tests, has been accompanied by the usual

Tests of Staybolt Material: Puddled Iron and Electric Steel				
	Elastic Limit (Lb. per Sq. In.)	Tensile Strength (Lb. per Sq. In.)	Elongation (Per Cent)	Reduction of Area (Per Cent)
Staybolt iron (a) ..	34,912	48,665	31.47	46.8
Electric steel (b) ..	39,260	56,710	33.5	65.5
Staybolt iron (c) ..	34,255	49,356	30.66	50.2
Electric steel (d) ..	37,762	54,532	35.4	66.7

(a) Average of many tests made in 1921, including $\frac{1}{4}$ -in., $\frac{1}{2}$ -in., 1-in. and 1 $\frac{1}{2}$ -in. bars from five different manufacturers, including Old Dominion.

(b) Old Dominion electric steel, average of the same four sizes, tested in 1921.

(c) Average of tests of Old Dominion staybolt iron in August, 1925, made for four railroads.

(d) Average of 14 heats of Old Dominion electric steel in 1925. This was furnished the United States Navy Department for anchor chain, but was made to the same specifications as staybolt bars.

(e) Based on averages of the figures above.

increase in ductility. The staybolt iron has retained about the same strength characteristics, has lost a little in elongation and gained considerably more in reduction of area.

Averaging the 1921 and 1925 tests of staybolt iron and comparing them with an average of the 1921 and 1925 tests of electric steel, the superiority of the latter material is shown in the table to be 11.4 per cent in elastic limit and 13.5 per cent in tensile strength.

Electric steel bars are made by the Old Dominion company for a wide variety of purposes, including not only staybolts, but engine bolts, chain stock, threading bars, forging bars, case hardening material and machinery steel. In a comparison of chain steel made by this process, and having almost precisely the chemical characteristics of a high grade of open-hearth chain steel, the material produced in the electric furnace showed a considerable superiority both in tensile strength and in elastic limit. It had a greater elongation than the open-hearth steel, with a somewhat smaller reduction of area. The electric tests showed 55,540 lb. tensile strength in a steel of 0.117 per cent carbon and 0.439 per cent manganese. The elastic limit was 38,440 lb. per sq. in., while the elongation and reduction of area were respectively 36 and 67.6 per cent.

*President Old Dominion Iron & Steel Corporation, Belle Isle, Richmond, Va.

Opening Frozen Blast Furnace Holes

Use of an Oxygen Lance for Tap Holes, Cinder Notches, Flooded Tuyeres—Speed and Certainty Features

BY E. E. THUM*

THIRTY years ago David Baker, in a brief paper before the American Institute of Mining Engineers, called attention to the fact that, while great improvements had been made in almost every blast furnace detail, it was requiring immeasurably more labor to tap molten iron. In older furnaces, small in size and running on low blast pressures, a single ball of clay would close the hole after draining the furnace. To reopen it later, one heavy blow on a long bar would ordinarily pierce through to metal. With the larger, heavily driven furnaces, however, a barrow load of clay is required to plug a hole 3 ft. deep—such a heavy filling is actually required to make the hearth safe. This material would bake hard, and of course had to be dug out before the next tap, only to find a thick shell of solid iron chilled against the plug. It would often require the labor of from 8 to 10 men for periods of time ranging from 10 min. to an hour before the entire obstruction could be removed.

Labor was plentiful in those days—a dozen huskies could be drawn from the stock house or the cast house. But the situation was different when such appliances as larry cars, skip hoists, pig casting machines and mixers cut the furnace crew down to 5 or 6 men. Faced with this labor situation Mr. Baker mounted a pneumatic rock drill on long guides, and counterbalanced the arrangement so it could be swung easily into position. The drill was held up to its work by a steam cylinder, 5 or 6 ft. long, double acting to withdraw the drill quickly when the iron began to run.

This scheme worked very well indeed, and today can be found in operation here and there as a regular tapping device. It never acquired very wide vogue, perhaps because even a big furnace, running normally, can usually be opened by two or three men with sledge and bar in 10 minutes. On the other hand, if the hearth gets cold, for any of several reasons, the iron chilled around the walls becomes so thick and tough that even the air drill can pierce it only with the greatest difficulty and after ruining a large number of bits.

Blow Torches and Electric Arc

While a furnace under proper management seldom gets into serious trouble, it frequently occurs that the tap hole does not open up readily. And it is of utmost importance that the furnace men have some method in reserve which will unfailingly open the tightest hole with the minimum of delay. Regularity of tapping is required to maintain uniform quality of pig iron; is most useful medicine for regulating the blast furnace itself, and is a necessity in the balanced operations of a modern steel mill. Consequently much thought has been expended on emergency methods and many devices have been proposed wherewith to open frozen tap holes.

Since the obstruction to be removed is solid iron, it is apparent that one good way would be to melt through. Various types of apparatus have been devised for this, such as blow torches using various fuels, and the electric arc. A great difficulty with the former is that the metal is such a good conductor of heat that it is all but impossible to get any of it up to the melting temperature with a blow torch. An electric arc is another available means. This requires heavy current (700 to 1000 amperes) at low voltage.

To generate and distribute this would require expensive equipment and heavy lines, not ordinarily pos-

sessed by blast furnace plants. While the arc melts its way surely into a metal skull, the process is tedious and most be interrupted at intervals to spoon out the molten iron on the bottom of the hole. Furthermore, a large hole must be made, to keep the current from short-circuiting between side of hole and electrode. It results that those furnacemen who have the correct means available resort to the electric melting process only as a last resort.

Early Uses of Oxygen to Open Frozen Tap Holes

It is possible to construct a much more efficient torch since the advent of compressed oxygen and fuel gases, now so commonly used in cutting and welding operations. Some spectacular demonstrations were given in the Pittsburgh region during 1908 by a German inventor, E. Menne, using his patented equipment. He had what would now be known as a cutting torch—a burner, protected against heat by a refractory covering, and supplied by oxygen and fuel gas under pressure. After melting into the obstruction with the intense flame he would blow out the liquid metal with a blast of oxygen at several hundred pounds' pressure, which, once started, would cut its own way. Menne was thus able to open a frozen tap hole in a few minutes.

But he was unable to collect many royalties because his burner could not withstand the intense heat generated in the bottom of a deep hole. It also burned away, leaving nothing but a pair of concentric pipes, and it was apparent that compressed oxygen was doing all the work.

The distinction of being the first to use oxygen for furnace tapping in America belongs perhaps to Randolph Bolling. In July, 1902, he found himself in possession of a blast furnace, badly chilled by a slip. Sledge and bar could make no progress and a hydrocarbon blowpipe had been operating for hours with little hope of success. In that extremity he bethought himself of two tanks of low-pressure oxygen in the laboratory, used for routine carbon analysis. He discharged this gas through a porcelain tube on the red hot iron in the notch, and fortunately was able to burn his way deep enough so that a chisel bar could be driven through to liquid iron.

Doubtless similar ideas occurred to other chemist-bred superintendents. In a letter to the Editor of THE IRON AGE (June 19, 1919), E. P. Ross describes the method he first used in 1903. He blew a stream of oxygen from a laboratory cylinder through a 1/4-in. iron pipe against a frozen cinder notch. After a coal-oil burner had worked 24 hr. with little effect, the oxygen opened the notch in a few moments, melting through the slag by means of the heat generated by burning the end of the pipe and the bits of coke and metal in the frozen furnace filling. This is the precise scheme now used at American furnaces. It also demonstrated that the very high pressure used by the Menne process was entirely unnecessary.

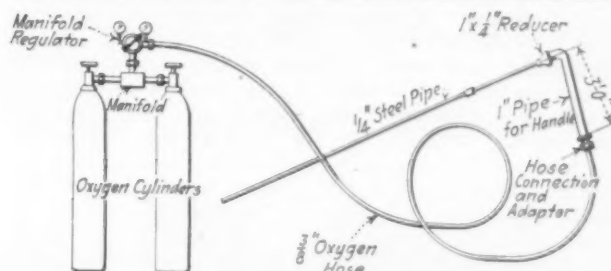
Shortly after these first recorded uses, compressed oxygen became a common article of commerce, and its use for emergency furnace tapping was exploited by the manufacturers. The idea rapidly spread, because it was evident that here is the cheapest kind of insurance against expensive delays. In fact, the oxygen lance is such an absurdly simple piece of apparatus, yet acts so quickly and unfailingly that some large furnace plants are now using it as the routine method for each cast. With it the opening of the iron notch, no

*Linde Air Products Co., New York.

matter what the condition of the furnace, is always the least of the troubles.

Routine Tapping with Oxygen

Suppose all preparations have been made, the crew having prepared the runners and flushed the slag. A 3-in. auger is used to drill through the clay. It is placed in correct position and supported by a guide bar, spanning the runner, bent into a little stirrup in the center. Power is supplied by a pneumatic or electric motor. About 2 min. is required to drill through the 3 ft. or more of clay filling—a chalk mark on the auger shank near where it rests on the guide stirrup



bore into the obstruction. A shower of sparks and white hot slag is blown back out of the hole. The operator keeps moving up as the end of the lance burns away, and within 2 to 5 min. after the oxygen has been turned on iron runs freely from the tap hole.

In this manner the cast commences in less than 10 min. after word is given to go ahead and is entirely completed in 35 min. On the average, less than 50 cu. ft. of oxygen has been used, and 20 ft. of $\frac{1}{4}$ -in. pipe burned up. These figures are taken from carefully kept records at a seven-furnace plant in the Pittsburgh district, where the practice was adopted as standard after careful study. The total cost of the materials used in the oxygen method is \$1.15 per tap, whereas it formerly cost \$1.43 per tap, mostly to sharpen and replace the chisel bars of high-carbon steel. The difference in cost is small, but on the right side. Its great advantage is in allowing collateral improvement, as will be indicated later.

No trouble will result, even if the auger has not drilled clear through to the iron, but is stopped in a mass of hard-baked clay. It may be computed that burning iron itself will generate a temperature something more than 2100 deg. C. (3800 deg. Fahr.), which is above the melting point of fire clay. However, com-

APPARATUS
Required
(Above) Is Simple and Inexpensive. The parts used up in the operation are the $\frac{1}{4}$ -in. steel pipe, which may be renewed by inserting a new piece each time, and some of the oxygen. At right is shown the apparatus in use, tapping a blast furnace



will indicate whether any progress is being made. After driving this auger to refusal, it is backed out, and the hole blown with compressed air. A few seconds is then required to shovel this fire clay from the runner.

If everything is well the bottom of this auger hole will show a faint red heat. A dozen pieces of soft coal are then pushed into the hole. It starts coking at once, and is ready to burn when the first oxygen strikes it. Coal is much to be preferred for a "starter" over a bar of iron, heated by thrusting into a tuyere. Altogether no more than 3 min. are required for these preparations; meanwhile the oxygen lance has been made ready.

As shown by the sketch, this lance is a simple affair. Oxygen cylinders connected to a simple manifold, and a proper pressure reducing valve or "regulator" are contained in a metal locker built against the walls of the cast house. Connection is made to a length of $\frac{1}{4}$ -in. gas pipe by $\frac{3}{8}$ -in. oxygen hose, through a handle made of 1-in. pipe. With a stream of gas blowing through, the lance is thrust against the hot coals in the tap hole. Intense combustion commences, rapidly heating the end of the pipe to the kindling temperature of iron, whereupon the burning pipe will furnish the heat necessary to reach and maintain the melting temperature of the clay, slag and iron and to

bustion of the iron results in a basic oxide (FeO), which will flux the acid oxides (SiO_2 and Al_2O_3) in the fire clay, making an iron silicate slag which melts at much lower temperatures. Thus the oxygen lance simultaneously provides three essentials for boring through fire clay: a flux, a source of intense heat, and a blast of surplus gas to remove the melted slag.

These reactions are easy to maintain because they are hedged in at the bottom of a hole—for that matter the surroundings themselves are at low red from the furnace heat. Consequently there is small chance of blowing out the flame. Ordinarily only a few seconds are needed to penetrate to metal, whereupon the reactions change. The material now being attacked is not only readily fusible, but will also burn in oxygen, forming an easily fusible slag. The surrounding metal has a high heat conductivity, but the heat generated by burning iron is so quick and intense that globules of iron melt away rapidly and are instantly blown back from the focus of reaction.

Economics of the Method

Since the oxygen lance provides such an unailing method, it is not strange that it would appeal quickly to furnace men who are running very hot furnaces, or making iron difficult to tap. Therefore one plant,

which often runs a high-manganese burden and at times makes a campaign on spiegeleisen, adopted the oxygen lance for routine work about 8 years ago. The practice here has become so regulated that no more than 25 cu. ft. of oxygen is needed to open up a furnace. Other large plants use it constantly, on easy and hard holes alike, because it burns out a smooth, free running opening, which never stops after once starting. When sledging a top hole is often happens that a mass of clay is jarred loose and, as the iron stream cuts away its support, it falls into the opening, completely stopping the flow. Or a tough mass of iron may not be pierced, but merely broken at the sides and bent back a little. Only a slight movement would then choke the hole, necessitating further sledging under most trying and dangerous conditions.

Large blast furnace plants are integral parts of huge steel mills, and irregularities of the source disjoint the whole line of operations. Hence, while regularity in tapping is fine medicine for the furnace itself, it removes one chance of delay in the steel-making departments. This advantage is hard to evaluate, but undoubtedly well worth while. Another point is this: the promptness with which the tapping is completed gives the crew more time to clean up runners and cast house. Thus, while it cannot be said that fewer men are required to open a furnace with an oxygen lance than with a bar, the modern method has done its part with other improvements, so that at one furnace it has been possible to drop one laborer from the crew. Finally, the men like the method. It wholly eliminates heavy sledging into tough iron, and fussing with a sluggish, partly opened hole. In other words, it eases the difficult task of getting a steady, contented crew.

It is too much to expect that all furnaces will adopt the oxygen lance for routine work. There still exist many small furnaces, making sand-cast foundry iron, which are easy to open. In case of difficulty a large number of ore shovellers or pig handlers are available. Likewise, the furnace has a blacksmith or handy mechanic who has little to do, and sharpening tapping bars helps keep him busy. Superintendents of such furnaces are apt to figure that it costs them nothing to open a furnace, unless it is a "sticker," and then the oxygen is always ready for a stand-by.

"Emergency operation" is a flexible term. At some furnaces oxygen is used only in dire straits. Other operators have found it so handy that if one bar is dulled without bringing the iron, no more time is wasted and the lance is immediately put into play. A recent canvass of a score or more plants showed that "emergency" furnace taps occurred about every three days. Since the obstruction at such times is thicker than ordinary, more oxygen is needed to burn through; 110 cu. ft. is the average. Several times as much is used on the first casts when blowing in a new furnace. Naturally, there is no limit to the penetration—a hole can be driven through solid iron to the center of a furnace in a half hour, and will get liquid iron if there is any present.

The Lance Itself

Only a few remarks are necessary about the lance itself. It is very simple.

Two to five cylinders are manifolded together, and discharge through a regulator specially constructed for free flow of large volumes of gas; $\frac{3}{8}$ -in. oxygen hose (rather than pneumatic hose), non-armored, should connect the regulator to a 4-ft. piece of 1-in. pipe, bent into a right angle one foot from the end. The hose is long enough to reach from the cylinder locker to the tap-hole—50 ft. will ordinarily be ample. A 1-to- $\frac{1}{4}$ -in. reducer allows $\frac{1}{4}$ -in. steel pipe (the lance itself) to be attached to the handle. Each piece of this pipe should have a sleeve connection, and the threads should be easy running. It is freed of oil or grease (which burn spontaneously when struck by oxygen) by placing on the iron runner just after the cast and then blowing the charred carbon out with clean compressed air.

Frozen Cinder Notch

It does not require much imagination to see that the oxygen lance will be a most useful tool in other

places about a blast furnace. Thus, a frozen cinder notch comes to every furnace at intervals. Such a condition may be caused by a small slip in the furnace occurring shortly after slag has been flushed, whereupon molten iron is splashed against the upper part of the hearth walls. A mixture of iron and cinder of this sort is extremely difficult to break open, but offers little resistance to an oxygen lance, since the metal in the mixture will burn and provide a notable supplement to the heat generated at the pipe-end.

Again, when rescuing cold furnaces it is sometimes necessary to cast through the cinder notch for a while. Under these circumstances the coolers and monkey would be removed and the opening plugged with brick and fire clay. When normal operation is resumed and it is desired to replace the notch a great deal of extremely hard work is ahead of the crew in cutting away the hard-baked mass of clay, brick, slag and iron. These iron veinlets which honeycomb the structure are quickly attacked by the oxygen lance, allowing large chunks of material to be loosened and removed entirely. Here, again, the intelligent use of oxygen has reduced the labor required to a minimum.

In a normal flush it may be more difficult to attack a dense mass of clean slag frozen against the bott, but the same principle holds for this operation. Intense localized heat is needed to melt it, and a blast of gas to remove it as soon as liquid. Heat must be supplied entirely from combustion of the iron pipe lance—fortunately it is used to best advantage, because slag conducts heat away from its source very slowly indeed.

Combustion may be started by preheating the pipe end in a coke fire. Or an iron bar may be thrust through a tuyere cap and then placed, red hot, alongside the lance against the cinder to act as a match. To concentrate the heat and avoid undue radiation, the entire notch may be filled with loose fire brick, except for a small hole leading to the opening in the monkey plate. This acts also as a guide for the lance, keeping it properly centered and avoiding any possibility of damaging the water-cooled plates or their connections. However, the castings are usually of copper or bronze, and these do not burn readily.

Plugged Tuyeres

At times tuyeres are also difficult to keep open. Doubtless there will always remain the necessity for driving a rod through them to explore the condition of the furnace interior. But it sometimes occurs that a tuyere is plugged, either intentionally or by some operating malady, and fills up or skulls over with a mass of iron hard enough to dull bars as fast as they are brought up. Under such circumstances the oil blow torch may be brought into play or, when heroic measures are necessary, even an electric arc. But a simple oxygen lance is immeasurably superior and quicker than either of these now antiquated devices.

Tuyeres also burn out from time to time. Often they cannot be removed because a large lump of plastic iron will be found sticking to the end, holding it fast. Under such circumstances an oxygen lance will quickly remove the obstruction and the tuyere may be replaced with the minimum of delay.

Again, the furnace may be running cold and sloppy at the tuyeres and for some reason it may be necessary to shut off the blast. The molten material in the furnace immediately floods the tuyeres and blowpipes. Sometimes the blowpipe itself is burned through, and the hot metal dropping on the tuyere cooler will damage it more or less. Such circumstances usually result in a mass of frozen metal on all sides of the tuyere opening which is almost hopeless to attack with sledge and bar.

The modern procedure is something like this: the blast being down, the blowpipe is broken off as short as possible. The oxygen lance then attacks the hot mass, cutting around the plug so as to open up a channel between it and the water-cooled equipment. When this penetrates through to the nose of the tuyere a cone of solid iron can be removed. A little more cutting with an oxyacetylene blowpipe will free the copper castings so they can be replaced, water connections made, a new

blowpipe set in, and everything is ready for another start. This method seldom damages the coolers beyond easy repair by welding.

Such real emergency uses of oxygen have been made by furnacemen for many years. In fact, most of them are mentioned by David F. Baker in an article entitled "Oxygen Gas in Blast Furnace Operation," appearing

in THE IRON AGE, Aug. 24, 1916. Of course it is impossible to present any average figures on the consumption of oxygen and pipe in these operations, since they vary widely. In any event, the cost of materials is a mere bagatelle as compared with the prospective loss due to lowered production of inferior iron, or a furnace entirely out of commission.

Steel Direct from Iron Ore*

New Electric Process Developed in Sweden—Low to High Carbon Quality Steel Claimed Possible

A SERIES of experiments in the direct smelting of ore by electric means, carried out at the electrochemical section of the Royal Technical High School at Stockholm during the years 1923-25 are described in this paper. The electrochemical section of that establishment, the principal of which is Prof. Wilhelm Palmér, is equipped with a special electrometallurgical laboratory, open at a nominal cost to qualified inventors, so that they may elaborate their ideas to the benefit of the industry by carrying out experiments on a sufficiently large scale to be of practical and scientific value.

The object of these trials was to ascertain whether malleable iron and steel can be extracted direct and continuously from iron ore, and at the same time to reduce the percentage of phosphorus and sulphur content in the ore and coal. An electric furnace was specially constructed for the purpose, working with a load of about 30 kw.

A few trials alone sufficed to establish that iron with carbon from 0.02 per cent and upwards could be produced without difficulty. In order to prove that this was not merely a chance result from a small number of smeltings, 65 such trial reductions were made in a furnace of the particular construction mentioned, the results of which fully bore out that the method pursued was on the right lines. The effects were so encouraging that, on the initiative of G. Cornelius and A. Hammarberg of Stockholm, it was decided to test the process thoroughly on a reasonably large industrial scale at the iron works at Hagfors, Sweden. An electric furnace with a load of 250 to 300 kw. was used, and up to the time of writing 114 tappings have been made.

Analyses made at the chemical laboratory at Hagfors show the composition of the product to be:

	Per Cent
Carbon	0.02 to 1.32
Phosphorus	0.003 to 0.017
Sulphur	0.009 to 0.077

*From a paper by Henning Flodin, Stockholm, Sweden, presented at the autumn meeting of the Iron and Steel Institute. In THE IRON AGE, Dec. 4, 1924, a brief announcement of the Flodin process was published.

The following results of tests carried out by O. Caspersson, engineer, indicate the physical and mechanical properties of the iron and steel produced:

Tensile Tests					Condition of Test-Piece
No. of Tapping	Yield Point Kg. per sq. mm.	Breaking Strength Kg. per sq. mm.	Elongation per cent	Reduction of Area per cent	
19	24.3	32.4	34.0	59	As rolled.
26	22.2	32.5	30.0	64	Turned from 25 mm. square, rolled bar.
27	25.4	35.3	28.5	65	Turned from 28 mm. square, rolled bar.
41	...	40.8	29.5	63	Turned from 12 mm. round, rolled bar.
42	...	45.8	12.0	61	Wire, as rolled.
42-1	...	37.7	29.0	73	Wire, as rolled and annealed.
56	31.8	45.8	25.0	54	Turned from 28 mm. square, rolled bar.
16	36.2	47.2	24.7	43	As rolled.
60	45.8	89.8	8.5	15	Turned from 28 mm. square, rolled bar.

*The elongation is measured on a gage length of 10 times the diameter of the test-piece.

It may here be observed that, during one of the furnace runs at Hagfors, the author was requested to vary the proportion of carbon in several successive tappings:

Per Cent Required	Per Cent Obtained
(1) 0.40	0.42
(2) 0.20	0.23
(3) 0.80	0.78

Thus it was found that there was no difficulty whatever in producing iron and steel of any desired carbon percentage at successive tappings without interruption, showing that the process can be controlled in the same manner and quite as easily as the discontinuous open-hearth process. The manganese and silicon contents are controlled in the same manner as in the open-hearth process. From heat No. 3 containing 0.78 per cent carbon, an ingot was taken and rolled out at the Forsbacka Ironworks, Sweden, and the material was used for making chisels for pneumatic hammers, drills, and miners' sledges, mainly for the purpose of testing the material. The chisels have proved to be fully equal to those made of the firm's own Bessemer steel, and



Steel Ingots Made by the Flodin Direct Electric Process

nearly as good as those made of special steel alloy for the cutting out of blanks of hard steel and chrome steel (1.40 per cent chromium, 1.10 per cent carbon). The drill penetrated 0.4 meter into granite in a wet borehole without regrinding, and 0.6 meter into hard sandstone bored dry. Better results cannot be obtained with the best Bessemer steel. The sledges were even superior to those made of 1a Bessemer steel.

The total radiation surface of the experimental furnace at Hagfors was 30 sq. m., and when running empty the furnace took about 100 kw. At a load of 300 kw. the furnace was therefore working with 200 effective kilowatts.

A 3000-kw. furnace has a radiation surface 2.5 times larger than the experimental furnace, or 70 sq. m., so that the heat loss would be $2.33 \times 100 = 233$ kw.

In this furnace the effective load is therefore $3000 - 233 = 2767$ kw. The losses due to water-cooling in the molds, in contact rings and refrigeration, etc., amount to 263 kw., making the total loss 500 kw.

The loss on current at a load of 300 kw. in the experimental furnace was 33.3 per cent. In the 3000-kw. furnace it was 16.65 per cent. The loss on transformers and lines is not included, as the measurements were taken close to the furnace. For this moderate expenditure of energy the price is not so important a factor as one would be induced to expect at the first glance.

At a load of 300 kw. 1 ton of iron was produced in the experimental furnace, with an expenditure of 2700 kwhr. Deducting 100 kwhr. for empty running, the production thus amounted to 111 kg. per hr.

The 3000-kw. furnace is to work with a net amount of 2500 kw. (3000 less 500 kw. loss). The production will therefore be:

$$\frac{2500 \text{ kwhr.} \times 111 \text{ kg. per hr.}}{200 \text{ kwhr.}} = 1388 \text{ kg. per hr.}$$

The gross expenditure of energy in the furnace will thus be:

$$\frac{3000}{1.388} = 2162 \text{ kwhr. per ton of iron.}$$

The heat content of the waste gases amounts to between 2700 and 2900 cal.

If in Scandinavia the cost of hydro-electric energy is put at 50 to 60 crowns (55 to 66 shillings) per kw.-yr., it is evidently cheaper than steam-power. According to American statistics, the price of water-power is \$15 to \$25 per kw. per year, and the cost of power from large steam-power stations is \$20 to \$25 per year. These prices of course hold good only for a constant load by day and night. With regard to future power stations installed at a great cost to take a maximum load for some few hours per day only, the conditions are of course different.

With respect to the method itself, it is unnecessary

to point out that in this direct process the previous production of pig iron is dispensed with. The process works direct on a mixture of ore and coal in a single furnace, and the product is in the form of malleable iron and steel capable of being teemed into chills or other molds in the usual manner. The process, however, does not only work direct as "one single process," but is continuous, interruptions occurring only at the moments of tapping, when the continuous feeding in of the mixture of ore and coal ceases, to recommence immediately after the tapping is complete. The operations must, of course, be carried out in such a manner that the furnace is fed with the mixture of coal and ore in quantities corresponding to the capacity of the amount of electric energy supplied for reduction and fusion.

The reduction of the iron proceeds uninterruptedly and continuously. The metallic iron particles reduced from the ore may be compared to a fine rain continually dropping through the slag bath to the bottom of the furnace, where the molten malleable iron constantly accumulates. Practically speaking, the iron is in a fit condition at any moment for tapping in varying quantities in proportion to the rate of reduction, and it is hardly to be imagined that a higher degree of continuity can be reached in any process for the production of iron.

The raw materials used at Hagfors in the experimental furnace are Swedish hematite ore, and both English pit coal and Swedish charcoal. No refinement in special furnaces is necessary for the removal of phosphorus and sulphur to a sufficiently low point, the process being based on the principle that in the reaction the molecules are in contact, thus facilitating the transfer of the phosphorus and sulphur to the slag. A specially low-carbon material produced by the "one single process" may perhaps meet certain requirements for electric and magnetic purposes, and the product is generally suitable for any purpose where an extremely low percentage of carbon in the iron is desired. After the thorough tests to which both the iron and steel materials produced at Hagfors have been subjected, the author is satisfied that their quality is superior both to the open-hearth and the Bessemer products. While it is true that no scientific investigations have been made into the causes which make such results possible, we are justified in assuming that the superiority of the product of this electric process is due to the relative absence of gases and the small amount of slag. The process works constantly under exclusion of air, and with a slight over-pressure in the furnace. Attention is specially directed to the low percentage of carbon (0.02), and it may confidently be expected that cheap stainless iron and steel produced by the "one single process" will soon appear on the market.

Dimensional Changes in Tool Steel

WASHINGTON, Oct. 31.—Everyone knows that steel expands and changes with temperature, but aside from these temperature changes it is ordinarily thought that anything made of steel is unchanging in dimensions, except, of course, when the metal is actually worn away.

However, steel undergoes dimensional changes, some of which are produced during the tempering processes which form a part of many manufacturing operations, while others occur as the steel "ages" with time. These changes are of sufficient magnitude to be of real concern to makers of precision gages and to the users of these tools.

The Bureau of Standards has been investigating the changes accompanying tempering and ageing of tool steels and has discovered that in tempering, changes in length occur in three distinct stages depending on the quenching temperatures and rates of cooling. The changes with time also are results of the changes produced by tempering, the contraction with time being identified with the initial contraction produced on tempering, and expansion with the expansion which follows the initial contraction, produced by the tempering. From these correlations, the Bureau of Standards has

secured information concerning the control of the time changes in tool steel.

National Enameling Offices Move to Milwaukee

The National Enameling & Stamping Co. is about to transfer its general offices from New York to Milwaukee and has leased large floor space in the First Wisconsin National Bank Building. Alfred J. Kieckhefer, general manager of the Milwaukee works, was elected president of the company a short time ago. He is the son of the late Ferdinand A. W. Kieckhefer, who established the Milwaukee plant and in 1899 took the initiative in the organization of the present corporation which was a merger of a number of the largest works in America. The main offices at that time were established in New York, where they have since been maintained.

"Flow in a Low-Carbon Steel at Various Temperatures" is the title of technological paper No. 296 of the Bureau of Standards. The authors are H. J. French and W. A. Tucker.

Making Locks for the U. S. Mails

Producing 8000 Locks Per Day to Protect the Mails
in Transit—Other Products of Post
Office Department Shops

PROBABLY few know that Uncle Sam makes and repairs his mail sacks, pouches and locks in a plant operated solely for the mail service. At Fifth and W streets, N. E., Washington, there stands a modern, well-lighted, factory-type, two-story building, where this work is done. This busy place is known as the mail equipment shop of the Post Office Department.

The shops are divided into two major sections, one devoted to the production and repair of mail sacks and pouches, the other to the manufacture and repair of the various kinds of mail locks, keys, and attachments for mail bags. In this latter section are also repaired canceling machines, scales, numbering machines, and motors. Occasionally, the shops undertake the manufacture of special equipment for the postal service. A notable instance is the table for facing letter mail shown in the illustration.

Approximately 8000 of the present type of ordinary mail lock, known as the "LA" lock, are being manufactured at this shop every working day. More than 5,000,000 of these locks are now in service and it is the intention to increase this number to 10,000,000.

The "LA" lock is unusual in appearance because the shackle does not extend beyond the case. It was developed in the shops at the time that mail was carried on a weight basis and one of the principal objects was to design a serviceable lock of light weight, with sufficient tumblers to make it reasonably secure yet strong enough to stand rough usage. Notwithstanding the small size and weight, it has been found to be the most serviceable of any the Department has used. Approximately 375,000 lb. of hard cold rolled steel 0.062 in. thick will be made into lock cases this year. It will require 55,250 lb. of brass wire to make the pins or rivets and 104,550 lb. of rolled brass for the tumblers and other parts. About 6000 lb. of phosphor bronze spring wire will be needed for the tumblers and 100,000 lb. of castings for forgings for the shackles.

For the production of these and other parts, the press room is equipped with 32 presses, the so-called lock makers' pillar type predominating. All dies and tools are made in the shop tool room and a high degree

of skill is required in this branch to produce tools suitable for the requirements of the shops. It must be remembered that these locks are unlocked at every post office in the United States. This means that every "LA" lock key must be alike and that every one of the millions of "LA" locks must be capable of being unlocked with any of these keys, thus requiring a standardization of parts seldom needed in a lock factory. The dies are mostly of conventional types of blanking, piercing and bending, with sub-dies where required.

After leaving the presses, the turned-up edges of the caps and plates comprising the case are ground to remove inequalities and bring them to proper depth. After tumbling, they are taken to another department where milling operations are performed, after which they are coated with tin and are then ready for the insertion of pins in the assembly section. Here is found a battery of eight high-speed riveters, used for riveting pins to the plate and "capping up." The tumblers, after leaving the press room, also go to the assembly section for the insertion of the springs. This is an interesting operation. The tumbler is placed on a revolving dial, where it is carried around to be slotted. The spring in the meantime has been cut off from a coil of wire and as the slot reaches this point the spring is forced into it and at the next stopping point it is shaped around the end of the tumbler, which is then ready for assembly. Some of the most important features of this machine were developed by workmen of the shop.

The shackle blanks, either castings or forgings, are passed through trimming dies to make them uniform, drilled and reamed.

Various parts composing the lock having been kept to standards, it is a comparatively simple matter to assemble them, deftness of the boys who do this work being the main consideration.

Besides the locks for protecting ordinary first class and parcel post mail, the rotary, or registering lock, upon which the safety of registered mail depends, is made in the shops. This lock is quite complicated. As

***T**his Machine,
Designed for
Facing and Stack-
ing Letters for
Postmarking and
Cancelling, Was
Designed by R. J.
Jerolemon (right)
and Produced by
the Mail Equip-
ment Shop of the
Post Office De-
partment*



the name implies, it cannot be unlocked without changing the number on the dials. The plant also makes the rotary locks used in international mail service, and the different types of locks used on street letter boxes. If any become defective, they are repaired in the shops.

All closing devices for the mail containers likewise are made in the plant. This includes grommets, cord clamps, cord fasteners, pouch fasteners, label cases, etc. Grommets are used as eyelets through which the cord is passed to close the sacks. For years it was thought that brass grommets only, made on eyelet machines, would answer the purpose, but, officials said, these shops demonstrated that cold rolled steel drawn with

a "step" punch and coated to avoid rust could be made considerably cheaper and would hold better in the canvas. When, not long ago, zinc became more plentiful and cheaper, it was tried and was found less expensive than cold rolled steel. These grommets are made on a lock-maker's pillar press at a tremendous speed, 80,000 being produced per 8-hr. day.

A fastener that will automatically hold when a mail sack is closed has been developed in the shops. This cord fastener is produced at the rate of 4000 per day and more than 620,000 lb. of cold rolled steel, together with several tons of wire, are used annually in its manufacture.

FIRE TANKS WELDED

Process Used in Construction of Gravity Sprinkler System for Office Building

BY CHARLES SEITZ*

MARKED progress has been made in putting welding on a scientific basis, and pioneer work in extending the application of the process to new fields is constantly being undertaken. A recent application of interest is the welding of gravity tanks used in connection with automatic sprinkler systems for office buildings.

Owners of skyscrapers and other buildings, in order to comply with the municipal fire prevention regula-

the usual piping, filled with water, and automatic sprinklers having deflectors designed to spray the water over the area desired. The construction of these systems is in conformity with rigid rules and regulations of the fire insurance companies, which maintain an organization of engineers and inspectors whose duty it is to see that each and every system is built in accordance with these specifications.

In order to extend the application of welding to this field, the American Welding & Machine Works, Inc., 66 Marshall Street, Newark, N. J., approached the New York Fire Insurance Exchange, the local organization, for permission to weld the tanks. Permission was readily granted in the case of the gravity tanks but the proposition of welding the pressure tanks has been referred to the board for its consideration.

The first contract obtained was for the big gravity tank on top of the Greely-Arcade, a seventeen-story office building located at 127-131 West Thirtieth Street, New York, and extending through to Thirty-first Street. This tank, which supplies the sprinkler system for the building, is 26 ft. long, 14 ft. wide and 9 ft. 8 in. deep, and is divided into two compartments, roofed over and made accessible through two hatchways. Its capacity is 25,000 gal.

As soon as the building was up and the tank platform erected, some 20 ft. above the roof, the 14 tons of steel plates required were hoisted and then set in place on the platform for welding. Next two electric welding machines driven by gasoline motors were lifted to the roof and the work started. The plates were 5/16 in. thick and the joints formed, where two plates came together at right angles, were simply filled in with welding material, due precaution being taken to get sufficient penetration. With the butt joints it was different. Ordinarily where two steel plates butt end to end they should be Veed out, but to avoid hoisting a compressor, such as is used in marine work, the seams were covered with strips of steel 2 or 3 in. wide and 5/16 in. thick, and both edges welded to the plates. Two tiers of stays were placed in the tank and the ends welded directly to the sides and ends. For outlets, holes were cut through the side and bottom plates by means of oxyacetylene torches and threaded flanges were welded in electrically. Holes for hatchways were cut out in a similar manner. The top was welded on and the ladders for entering the tank were welded in place. When the tank was filled with water there was not a pinhole leak in any seam.

The accompanying illustration shows the partly welded corner seam of the tank. The two holes at the end of the weld were burned for the shackle bolts used for hoisting plates into position.



Partly Welded Corner Seam of Tank for Automatic Sprinkler System

tions and at the same time obtain the required amount of fire insurance coverage at the minimum rate, usually install automatic sprinkler systems designed to be supplied with water from gravity or pressure tanks erected on or above the roof. The system further consists of

An increase in production of 150 per cent over previous methods is claimed to have been achieved by the use of a Foster 1-B universal turret lathe in bearing a housing cap for a farm tractor. The material was hard cast iron. The saving effected in the cost of production of this piece was 16½c. per piece, or \$20.30 per 9-hr. day. The Foster Machine Co., Elkhart, Ind., announces this result as indicative of the savings which may be made by manufacturers when the proper type of machine tool is selected for the work to be done.

*Vice-president, American Welding & Machine Works, Inc., 66 Marshall Street, Newark, N. J.

Drawability of Sheets and Strips

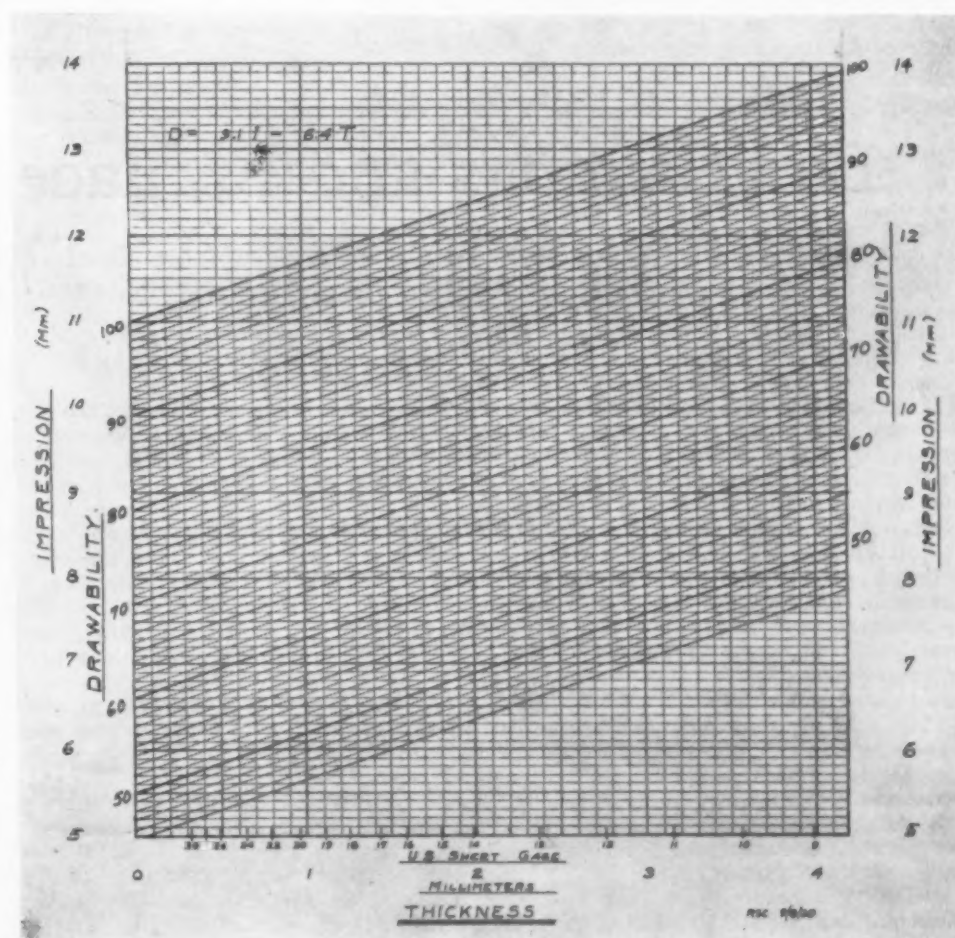
Marco System of Measuring—A Simplified Method of Expressing Erichsen and Similar Results

BY H. S. MARSH AND R. S. COCHRAN*

IT is plain that two interdependent variables are harder to keep in mind than a single variable expressing the relation between them. In testing sheet metal by means of the Erichsen ductility machine the results are expressed in terms of both the gage and the "depth of impression." Since 20-gage sheets of the same quality as 14-gage sheets have widely different "impressions," it is difficult to keep the relations clearly in mind and avoid confusion.

ingot, was cut into suitable lengths and rolled into sheets of different gages. Samples from these sheets were heat treated together in different ways and the results plotted. It was found that the resulting lines were straight and parallel. The line representing the heat treatment producing the highest draw obtained at that time was arbitrarily called 100. A chart was then drawn having a line for each percentage of drawability. The test by our method is made in the following

Diagram for Relating the Drawability of Steel Sheets and Strips to the Weight of Material. Use of such a method avoids necessity for expressing results in the two terms of gage and "depth of impression"



To simplify this we have established by experiment the relation between these two variables and have prepared a chart which enables the results to be converted instantly to a single figure which requires only a fraction of the effort to understand and remember. By this system a 14-gage sheet which draws 90 is exactly of the same quality as a 20-gage sheet which draws 90, and 90 is the only figure to be remembered. The figure 90 may be thought of as representing 90 per cent of the depth of the deepest draw we have been able consistently to produce.

The line on the chart representing 100 per cent material was established as follows: One piece of sheet bar, selected so that it came from the lower half of an

manner: The sample is sheared $3\frac{1}{2}$ in. square and a small amount of heavy lubricating grease is applied to both sides of the piece. The piece is clamped in the dies and the thickness of the sheet is noted. The dies are then loosened 0.05 millimeter in the usual way and the plunger advanced until fracture occurs. The movable collar is not moved from the zero setting. The depth of impression is then read, with the collar still in the zero position. By referring to the chart the drawability figure is found. Thus a 16 gage sample measuring 1.6 mm. in thickness, and having an impression of 10.6 mm., has a draw of 86.

In routine testing of sheet steel the test pieces are ordinarily taken from one sheet in each hundred by cutting a strip $3\frac{1}{2}$ in. across the sheet a few inches from the end and then taking samples from this

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strip. To avoid the expense of cutting good sheets, tests are taken from sheets rejected for surface or other defects. Naturally, such defects should not appear in the test pieces, because they frequently affect the results.

The Erichsen plunger is shaped like a hemisphere whose diameter is about 25/32 in. The diameter of the die is 1 1/16 in. and the radius about 0.04 in. A 3/4-in. ball in a socket can be used without affecting the results. Other makes and designs of drawability testing machines are on the market having the same type of plunger and die. The relative sizes, however, vary. For each combination a chart could be prepared similar to the one in question and by the same method.

Conversion of Readings

To convert the readings taken, as prescribed by the Erichsen instructions, for use with the Marco chart, it is necessary to subtract the gage from the impression. This is because the gage is mechanically added by shifting the collar. We introduce a slight simplification of procedure by so drawing the chart that the collar is never shifted from the zero setting. Conversely, to convert the Marco figure to usual Erichsen figures, add the gage to the impression found on the Marco chart. Thus a 16 gage sample having a Marco draw of 86 shows an impression on our chart of 10.6

mm. To convert this to usual Erichsen figures, add the gage, 1.6, to 10.6, 12.2 mm., which is the corresponding Erichsen figure.

By way of standards by which to connect in one's mind the drawability figures we classify drawing steels as follows:

Class	Draw
Special	95-100
Extra deep	90-95
Deep	85-90
Common	80-85
Poor drawing	70-80

Our conception of the property termed drawability is that it is a balance between two opposing factors. Thus, a steel of comparatively high tensile strength is of comparatively low ductility, whereas a very ductile steel is likely to have insufficient strength to withstand the tremendous and complicated forces that are in action in a drawing operation. A steel testing above 95 is likely to be too soft for many purposes, but satisfactory for others. It depends on the mechanical treatment given it on the press.

Likewise, steels which are blue annealed in the usual way are frequently too stiff to draw well, because they are chilled by cooling on a cold floor or cooling bed. Such steels, although their microstructure may be good, may show only 75 draw. Thus, the balance of properties necessary for usual drawing operations is attained when the tests range between 80 and 95.

Bad Castings and Furnace Scrap

If Oxygen Troubles Come from Scrap, Why Not from Ore?—Evidence That Complaints Against the Pig Iron Were Probably Not Well Founded

BY H. H. HOPKINS

IT takes very little investigation to convince one that a great number of merchant furnaces are using varying quantities of scrap in their mixtures; a little further investigating will bring out the fact that most of them are trying to conceal this practice from the trade. All of which brings up the question whether the use of pig iron, made partly with scrap, results in defective castings. While the question cannot be answered definitely, nor can very much accurate data be adduced, some practical results may be noted and some errors in reasoning pointed out.

Scrap and Oxides

The element that gets the blame for all of the trouble is oxygen. One eminent authority on foundry practice is quoted as saying that the use of scrap makes for poorer quality pig iron, since lime takes out only sulphur and does not disturb oxidation. Others, not so noted, maintain that the use of scrap introduces oxides into the furnace.

While it is conceivable that limestone may play some part in the deoxidation of the raw materials used in the blast furnace, it is extremely unlikely. The carbon of the coke in the form of carbon monoxide and also as solid carbon is the great reducing agent of the blast furnace. It may not be amiss to call attention to the well known fact that lime is not a complete desulphurizer—some sulphur always remains in the iron, though it may be reduced to a negligible amount. Furthermore, too much lime may bring about an opposite condition in the furnace, the sulphur becoming so high as to render the iron unfit for use.

Those who maintain that the scrap contains oxides seem to overlook the fact that iron ores are essentially oxides of iron. There is no apparent reason for assuming that the deoxidizing reaction is selective—taking oxygen from some materials and not from others. Many kinds and types of ore—hard and soft, coarse and fine, from different ranges and localities—are used together in the burden and so long as the furnace can be kept hot and working smoothly these have no injurious effect on the pig iron produced.

A short time ago the writer was privileged to follow up a case where defective castings were being made in the foundry. The casting in question consisted of a heavy section below a much lighter one, the risers coming off the lighter section. When the castings were machined, holes were sometimes found in the heavy section and these rendered the casting unfit for use. As this meant great loss, the manager of the foundry called in an expert, and after looking the practice over his verdict was "dirty iron." The foundry superintendent, a man of long practical experience, disagreed, stating that in his opinion the defect was due to shrinkage. It was then suggested that the method of molding be changed, so that some of the risers would come off the heavy section at the points where the defects usually occurred. This suggestion was never followed out. In the meantime, rival salesmen were busy with their propaganda, claiming that the trouble was due to the pig iron, which was made partly from scrap. The iron was changed and the trouble righted itself.

This looked like a clear case against scrap, so an effort was made to secure some further evidence that might throw more light on the question. It was recalled that a casting had been sent to a furnace company some 12 or 15 years ago and a complaint of a very similar nature had been made. The casting was a hub, and shrinkage had developed in the heavy section. When it was machined, holes were found on the machined surface and the casting condemned. This particular casting was kept in the laboratory for several years and the writer's attention had been called to it by the chemist who also pointed out the defects. Since the iron in this casting had been made years before any one had thought of using scrap, obviously the blame cannot be placed there.

Used Scrap, But Had No Complaints

Next, the manager of a company which had used scrap in its furnace mixtures was interviewed and his cooperation secured. The records of the company for a period of 15 months were carefully gone over and only one complaint that could in any way be attrib-

uted to the use of scrap was found. A malleable melter had complained that the pig iron contained chromium, which was without doubt derived from the scrap; but since the melter had continued to use the iron without further complaint, it was presumed that his troubles had righted themselves. This furnace company numbers among its customers some of the biggest melters in the country, and it was at once noted that no complaint had ever come from these. If they have any troubles, their careful supervision at all stages of the process probably rights the difficulty before any considerable number of defective castings are produced. In fact, these companies seem to buy on price and analysis only—paying no attention to brands, location or furnace companies.

From the foregoing we may conclude that the evils attributed to the use of scrap are probably overrated. Its use is an economic necessity and foundries must alter their practice—if that be required—so that sound castings can be produced from pig iron so made.

Large Derrick Barge on Coast

An all-steel wrecking and derrick barge, said to be the largest ever built on the Pacific Coast, was recently put into service by the Havaside Co., San Francisco. Its length over all is 125 ft., its beam 48 ft. and the depth of its hold 12 ft. About 500 tons of steel shapes and plates were required in its construction. It was designed and fabricated at Oakland, Cal., by the Pacific Coast Engineering Co.

A frame weighing 45 tons, 81 ft. high above the deck, with a factor of safety of 5 to 1, or more, for each member of the structure, supports a round steel boom. This weighs 25 tons, is 105 ft. long, 40 in. in diameter at the middle and 27 in. at each end. With the boom at an angle of 45 deg., the block and lifting falls hang vertically 36 ft. outboard from the side of the barge, and the boom can swing clear 180 deg. In this position, during tests, 100 tons dead weight were easily handled both in lifting and swinging. The barge is therefore capable of swinging massive machinery and heavy blocks of metal into ship hatches, which was one of the primary purposes for which it was designed.

There are three longitudinal trusses and three watertight bulkheads athwartships in the hull, and six large water ballast tanks of 500 tons total capacity situated fore and aft.

All running rope on the lifting gear was made especially for this job by the United States Steel Products Co., San Francisco. The hoisting and swinging engines were built by the American Hoist & Derrick Co., Seattle. Included in the wrecking equipment are four 14-in. by 14-in. double-cylinder steam towing engines, two

Oxygen may be, and undoubtedly is, present in all pig iron, but until better methods of determining this element chemically are found its true amount can never be determined with any great accuracy.

Scrap, like the hard iron ores that are difficult to reduce, melts low in the furnace, and quite a few makers of excellent foundry iron have long made it a practice to carry some such ores in their burdens, in the belief that they add to the strength and quality of the iron. The late J. E. Johnson, Jr., held this opinion and cited at least one example to prove his contention.

Iron made when a blast furnace is "in trouble" and working badly is almost sure to make trouble when remelted; but if the furnace can be kept working smoothly and regularly, the iron will be good regardless of the kind of raw materials charged. Of course, the use of alloy steel scrap in great quantities might introduce metals that would be injurious to the iron, without disturbing the working of the furnace, but such scrap rarely makes its appearance at the blast furnace.

steam anchor windlasses, chains, anchors, pumps, etc. Situated below decks are a lighting plant, water and fuel tanks, living quarters for the crew, and the steam plant, consisting of two dry-back marine boilers, built in San Francisco by the Eureka Boiler Works.

New Method for Determining Gases in Metals

A very accurate method for determining the amounts of oxygen and hydrogen in metals has been developed recently by the Bureau of Standards. The analysis, which will determine 1/1000 of a gram of oxygen and 1/10,000 of a gram of hydrogen in 100 grams of iron or steel, is made by sealing a sample of the metal inside a fused-silica tube, evacuating the tube, melting the sample in a high-frequency induction furnace, and collecting and weighing all gases given off from the melted sample.

Although the great variety of steels and non-ferrous metals and alloys that are used so extensively in everyday life are carefully analyzed at various stages in the process of manufacture, but little attention has been paid to the small amounts of gases which

such metals are known to contain. In the case of steels and cast irons this rather general neglect of gases has been due to the lack of satisfactory methods for their determination, although it was realized that their presence or absence had an important effect on the properties of the metal. This difficulty is now believed to have been overcome.

A complete description of this investigation will be published as one of the Bureau's scientific papers.



Wrecking and Derrick Barge, Said to Be Largest Ever Built on Pacific Coast, Handles 100 Tons Dead Weight Both in Lifting and Swinging

NEW OPEN-SIDE PLANER

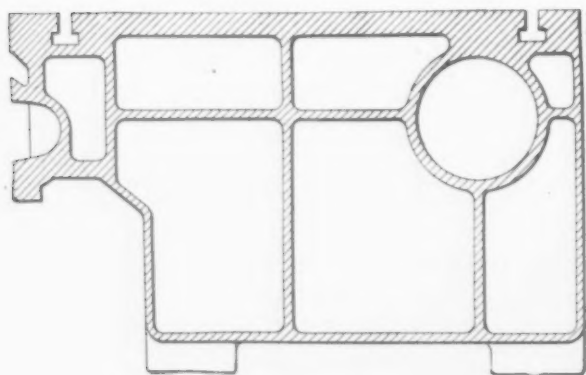
Selective Dial Feed a Feature—All Movements Controlled from Operating Position

A recent addition to the line of Hypro planers of the Cincinnati Planer Co., Cincinnati, is the open-side machine here illustrated, which incorporates many features of the company's double housing planer. As in the case of the double-housing machine which was described in *THE IRON AGE* of April 2, the improved features are intended to permit increased production.

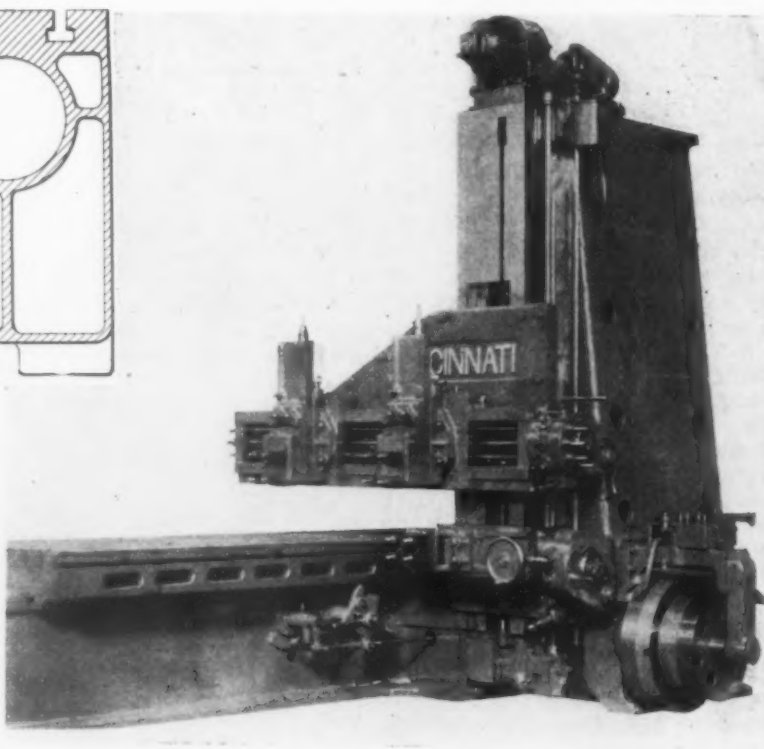
Selective dial feed, stressed as a new feature for open-side planers, is furnished for all heads, a single

Lubrication has been given special attention. Lubricant for the Vees, main bearings and gears is pumped from a tank in the bed as in the previous machines and thorough filtering of the oil is a feature. There are only a few additional oil distributors, these holding a two weeks' supply. The distributors serve to lubricate revolving parts and also sliding surfaces of the saddles and slides, the saddles riding on a film of oil when traversing the rail.

The bed of the machine is of double length, eliminating overhang and both bed and table are of box construction. As in the double-housing planer, the table is provided with inner guides between the Vees, which tends to absorb side thrust. A table clamp on the outside is intended to prevent tilting of the table under work that overhangs. Spring of the rail and



Rigidity and Convenience of Control Are Outstanding Features. The cross-section view of the column, shown above, pictures the ribbed box section incorporating at one point a tubular rib. This tubular rib provides space for the operation of the side head counterweight



turn of the knob giving a range of feeds from zero to 1 in. The feeds operate independently of each other and provision is made to prevent accidents from feeding the heads together. The single-turn rail clamping device is also employed in this machine, the rail and knee being locked automatically to the column at four places by turning the crank handle at the end of the rail. The elevating mechanism is disengaged automatically when clamping. A handle located conveniently at the front controls the movement of the rail, a similar handle being available on the side head for lowering the rail when the latter is in its highest position. An automatic trip disengages this mechanism when raised to the extreme.

A safety trigger gear has been placed on the rail and side heads, and in place of the former pin arrangement, a knurled knob is used to change the direction of feed. This eliminates the danger of injury to the operator's fingers.

Power rapid traverse is provided for all heads, which may be controlled from one handle or from independent handles located on the end of the rail or on the side head. All heads are independent of each other, which permits of feeding with one head and using the rapid traverse with any of the others. The slides on all heads have the inverted dovetail, which is claimed to add strength without increasing the distance from the face of the housing to the tool. The dovetail is said to become tighter under pressure. The machine may be controlled entirely from the operator's normal working position.

knee is claimed to have been practically eliminated. The high wall on the rail is integral with the rail and the outline of the knee is like that of the rail. The bed cheek presents wide area for attachment to the column. The cross section view of the column herewith shows the ribbed box section incorporating at one point a tubular rib as shown. This tubular rib provides space for the side head counterweight to operate inside the casting.

Worthington Diesel Engine Parts to Be Shown

At the marine exposition in New York, Nov. 9 to 14, the Worthington Pump & Machinery Corporation will feature the cylinder, piston and piston rod, and spray valve of its new double-acting two-cycle Diesel oil engine. Built for the United States Shipping Board, this engine has been in operation on a 30-day non-stop run and has withstood several million revolutions under full load.

It is said that, on the basis of specifications submitted to the Shipping Board for Diesel engines to be installed in 18 Government ships, the double-acting engine reduces weight about 30 per cent. Of the 14 Diesels ordered by the Shipping Board last December, five will be double-acting.

The average price of the Diesel engine awards made by the Shipping Board for the double-acting Diesel engines, per shaft horsepower, is \$75.80.

NON-STOP SEMI-AUTOMATIC

Machine for Production Drilling, Turning, Threading and Tapping

The Davenport Machine Tool Co., Inc., Rochester, N. Y., has brought out the semi-automatic, rotary-type, two-way machine here illustrated, called the Non-Stop, which is adapted for a wide variety of work, such as turning the ends of rods or castings, threading both ends of studs, drilling or reaming castings, or other work which can be performed with one tool. The machine is intended for operation on a large production basis, and its capacity is for drills up to $\frac{1}{2}$ in. in diameter, drilling to a depth of 2 in.

Specimens of work done are shown in the separate

up new work. Four drills on each end of the machine are in operation continuously, while in the fifth position the finished piece drops out and another piece is put in its place by the operator. The work is clamped in the jig automatically.

The opposing spindle carriers or revolving heads are alike, being provided with quills driven by pinions, which in turn are driven by an internal gear. The drill spindle advances through the quill, being fed by a slide. Quills are equipped with ball thrust bearings and the slide has a roller engaging with a stationary cam. An adjustable screw connection is provided between the two parts of the feed slide so that the drills that have been removed for grinding can be replaced and properly adjusted to position for drilling the work. The drills in both heads revolve clockwise. The jig holder, between the two revolving heads, is clamped securely

The Machine Is Set Up for Production Drilling of the Inside and Outside Members of the Hinge Shown at the Left in the Lower Right-Hand Illustration. The arrangement of revolving heads, jig holder and jigs may be noted from close-up view at right

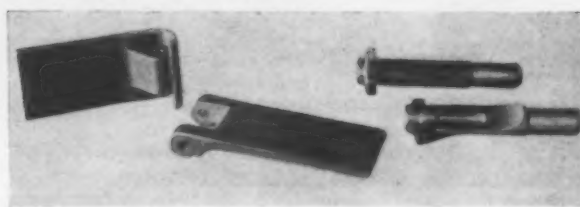
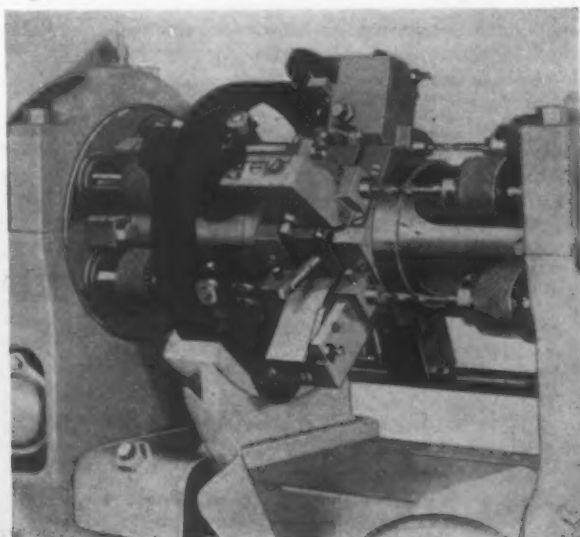
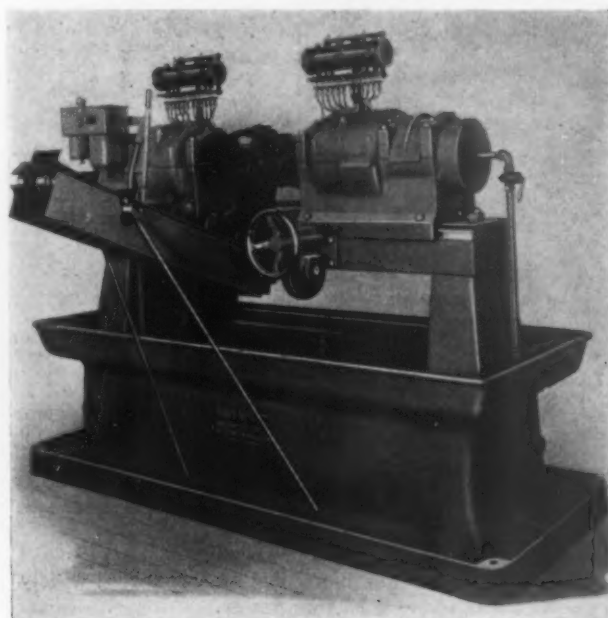


illustration. The shackle bolt at the right has the deep oil hole drilled after the tapped hole has been drilled and tapped. The machine itself is shown set up drilling the inside and outside member of the automobile hinge shown at the left in the illustration of the work. In drilling the outside member of the hinge, the drill is fed from each end of the machine, both sides being drilled simultaneously. In drilling the inside member, both drills are fed together until they almost meet, whereupon one drill is quickly withdrawn and the other drill completes the hole. In drilling the oil holes in shackle bolts, the drill is withdrawn one or more times to clear the hole of chips. In threading studs self-opening die heads are used.

The machine is called the Non-Stop because it can be loaded while running, and therefore, with the exception of the time for grinding drills there is no occasion to stop the machine during a half-day's run.

From the close-up illustration it will be seen that in each end of the machine there are five rotating spindles mounted in a revolving head. These heads are revolved in unison by means of a worm under the left-hand head which meshes with a worm gear mounted on the head. The jig holder serves to connect the two heads and assures alinement of the holes. The right-hand head is adjustable on the bed, permitting the use of jigs of different sizes for a variety of work. A hand-wheel is provided for revolving the heads for setting

to each head. The jigs, which are made up for the work to be held, are clamped to the holder and drill bushings are provided close to the work, as shown.

The work is clamped in the jig by a lever operated by a rod extending from the left-hand end of the machine. There it is actuated by another lever working in connection with a stationary cam. Side clamping against fixed stops is cared for by a lever with a roller running on an annular clamp. The revolving heads, jig holder and jigs revolve in a clockwise direction, permitting the operator to see whether the work is properly clamped and if the drills are functioning.

Change gears in a box at the rear of the machine permit of changing the feed of the drills and a pair of change gears is provided on the left-hand end for varying the spindle speed to suit the work in hand.

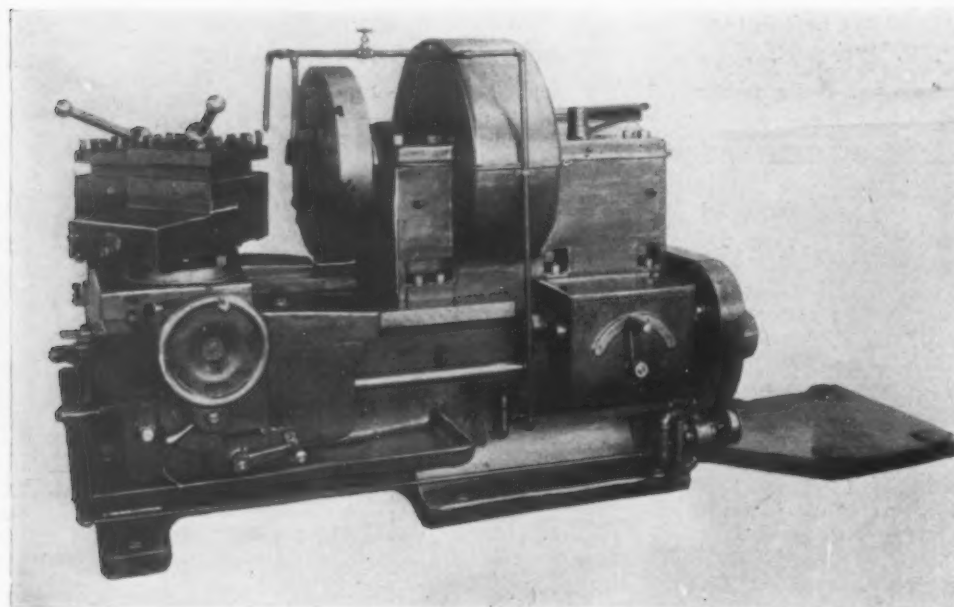
The machine illustrated is arranged for motor and silent chain drive, the motor being mounted on an adjustable plate in the base. The starting box is located adjacent to the left-hand head as shown. The base of the machine incorporates a reservoir for cutting compound and a strainer for separating the chips is provided. The coolant is pumped through the right-hand end of the machine to a point close to the drilling. Lubrication is ample, all high-speed shafts and spindles being lubricated from reservoirs and suitable piping.

A conveyor mounted as shown in the front view

may be provided for carrying the finished work from the machine and dropping it into a tote box or barrel. It is claimed that the machine will drill $\frac{1}{4}$ in. holes on each end through $\frac{3}{8}$ in. machinery steel at the rate of more than 1600 holes per hr., the production being dependent upon the speed of the operator in loading the jig.

Lathe for Turning Face and Back Angles of Bevel Gears

A special lathe developed by the Betts works of the Consolidated Machine Tool Corporation, Rochester, N. Y., for turning the face and back angles of heavy alloy steel bevel gears, is shown in the accompanying illustration. The machine is similar to that previously



Special Machine Designed for Turning the Face and Back Angles of Heavy Alloy-Steel Bevel Gears. The drive is through an adjustable-speed motor which may be mounted on the floor plate at the right

built by the company, except that it is much heavier and incorporates several improved features.

The bed is approximately 6 ft. long, is of heavy box section and has broad flat ways. The carriage is heavy and carries two independent cross slides which are arranged so that they may be quickly and securely clamped to the bed. Each cross slide supports a heavy swiveling tool slide, provided with square guides and each tool slide carries a revolving four-way steel turret tool post which permits the carrying of four tools simultaneously. The tool slides are designed for taking heavy cuts in extremely tough material.

Each side of the machine is equipped with independent feed box having four feeds, which permits of engaging separate feeds to each tool slide. Both aprons are heavy double-wall one-piece castings and carry a positive trip feed mechanism, arranged so that the feed may be instantly disengaged with the slightest pressure on the feed trip-lever, when the tool gets to the end of the cut.

The drive is by means of a 25 or 35-hp. adjustable-speed motor, which is mounted on a floor plate and connected to the driving shaft through spur gears. In connection with the two speed changes in the machine, a wide range of cutting speeds is obtained with a drive of simplified design. The gear blanks may be carried either in a chuck as shown in the illustration, or mounted directly on the spindle by means of an adaptor. Unusually rapid production is claimed because of the heavy cuts that may be taken and because both face and back angles may be machined simultaneously. The swing of the machine illustrated is 31 in. over the bed and 22 in. over the carriage. The tool slides have a travel of $8\frac{1}{2}$ in. in all directions.

Pneumatic Hammer with Balanced Throttle Valve

To assure the proper graduation of air admission for starting and control, the new Thor riveting hammer, of the Independent Pneumatic Tool Co., 600 West Jackson Boulevard, Chicago, is provided with a self-seating, balanced-type throttle valve. The handle is an alloy-steel drop forging and is made amply large to assure a natural grip for a large gloved hand. The handle lock is of the positive ratchet type, and it is held by an octagon milled on the barrel. The octagon gives eight positions for each tooth, so teeth will always mesh tightly. The main valve is a hollow sleeve, without port holes, and with walls of even thickness. The inside of the lower end of the valve is ground with a slight taper, eliminating the danger of the piston striking the valve squarely. This valve is made with large

surfaces to insure long life, precision of timing, and high speed. The exhaust and inlet are separated widely to prevent leakage and loss of power.

The valve block is hardened and ground all over and port holes are arranged in straight lines to insure direct passage for the air in its natural flow and to eliminate wire drawing. The barrel is of alloy steel, heat treated and the piston bore is hardened, ground



The Balanced Type Throttle Valve Is Intended to Assure Proper Graduation of Air Admitted

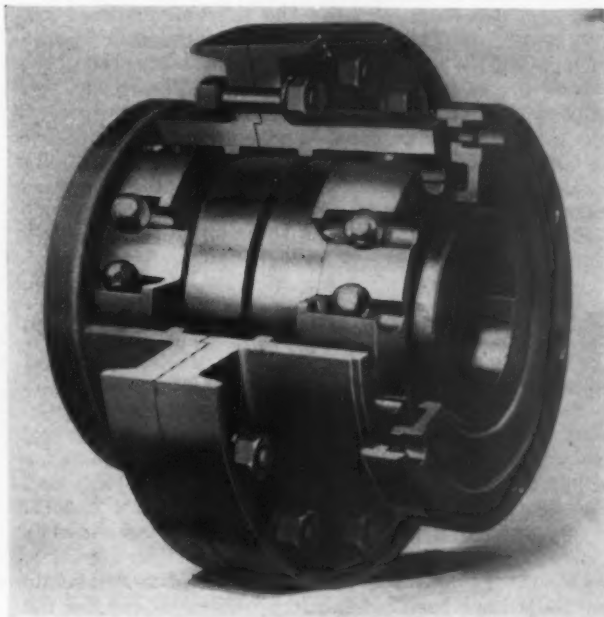
and lapped. The nozzle bore is hardened and ground. The exhaust is at the upper end of the barrel and may be deflected at any angle by turning the deflector.

Manufacturing census figures, issued by the Bureau of the Census and obtainable at 5c. for each pamphlet from the Superintendent of Documents, Washington, D. C., include the following: Machinery, machine tools, textile machinery and parts, showing 1923 production compared with 1921, 1919 and 1914; cast iron pipe, showing 1923 production compared with the same years as above; gas and coke industries, showing 1923 production compared with the same years as before.

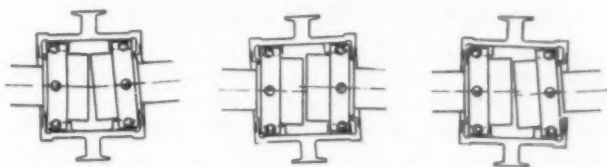
UNIVERSAL COUPLING

Claimed to Operate Efficiently Under Conditions of Gross Misalignment

A new shaft coupling, called the Sykes universal shaft coupling and differing from the usual flexible coupling in that it is actually a universal joint and is, therefore, capable not only of taking care of small errors in alignment but will also successfully connect shafts which are grossly misaligned, has been placed on



Sectional View of Sykes Universal Shaft Coupling. The sketches below show the manner of compensating for angular, parallel, and angular and parallel misalignment respectively



the market by the Farrel Foundry & Machine Co., Buffalo. Its limit of angularity is stated to be 5 deg. It will also connect shafts which are offset as much as 4 per cent of the shaft size, a coupling made for a 4-in. shaft, for instance, allowing an offset of 0.16 in.

From the accompanying illustration showing the coupling with a portion of its outer shell cut away, it will be seen that the coupling consists mainly of three parts, being therefore what is known as a three-element coupling. Two of the elements are in the form of hubs, one adapted to key on the driving shaft and the other on the driven shaft. The third element is made in halves and forms a sleeve, connecting the other two elements. The actual connection, however, is by means of balls bearing in races or grooves formed in lugs. There is one set of lugs on each of the hub members and corresponding lugs, inwardly projecting, on the sleeve member. The latter member is made in halves to facilitate installation. The three diagrammatic figures show the action of the coupling when operating under the three possible conditions of misalignment. It is stated that because the balls can take up a suitable position in their grooves or seatings so as to give true, uniform rotation, irrespective of the amount of misalignment, the coupling is a true universal joint. It is also claimed by the makers that universal action is the only requirement necessary in any so-called flexible coupling. This coupling is not designed to give torsional resiliency, and although by a slight modifica-

tion resiliency can be provided, the company does not advocate a coupling embodying this feature.

All parts are of steel, the balls being the standard hardened steel balls used for the highest quality ball bearings. Regarding the danger of rapid wearing of the balls or the ball races, it should be observed that the balls do not function like balls in a ball journal bearing, the conditions of operation being more analogous to the ball bearing crane hook. If one of the couplings is mounted in true alignment the balls will have no movement, and if operated under conditions of maximum misalignment each ball will have a movement of approximately 1/32 in. per revolution. Therefore, the velocity under the worst circumstances is pointed out as being very low. These couplings have been thoroughly tested in a wide variety of applications, several of them having been in use for nearly two years, 24 hours per day, seven days a week. It is claimed that none of them has shown wear or deterioration. In providing free axial movement of one shaft relative to the other, the coupling has been found of advantage in connection with electric motors.

It is stated that due to the use of balls as the power transmitting medium the question of lubrication is not important, the balls having such a slight movement that a film of grease provides ample lubrication. It is further claimed that even without lubrication the coupling will not suffer serious damage.

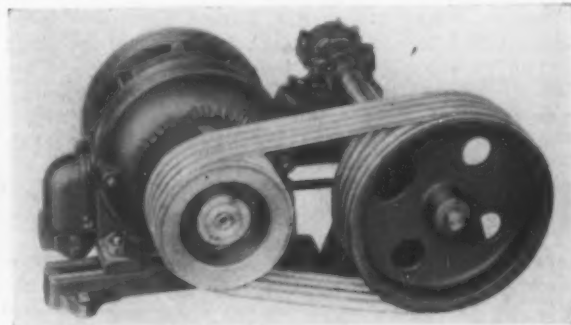
Analysis of the action of this coupling is said to show that, irrespective of the amount of swivel of one member relative to the other, the balls have a line contact with their races. That is to say, each race is substantially semi-cylindrical and each ball always has a full line contact with two races, therefore giving a line contact on the ball over nearly the whole of its circumference. Actually the races will deform under pressure from the ball and, therefore, give an appreciable load carrying area. The deformation, however, is always well within the elastic limit, so that no permanent deformation takes place.

The coupling is at present available for shafts ranging from 3/4 in. to 8 in. in diameter, the 8-in. coupling transmitting 1200 hp. per 100 r.p.m. Larger sizes will be manufactured later.

Multiple Belt Drive for Close Centers

The development of a new type of short center, flexible drive, known as the Texrope drive, has been announced by the Allis-Chalmers Mfg. Co., Milwaukee.

This drive, the arrangement of which may be noted from the illustration, consists of two grooved sheaves and a number of special endless Vee belts. The sheaves



The Special Vee-Belts Used Are Claimed to Eliminate Slip and Provide Positive Drive

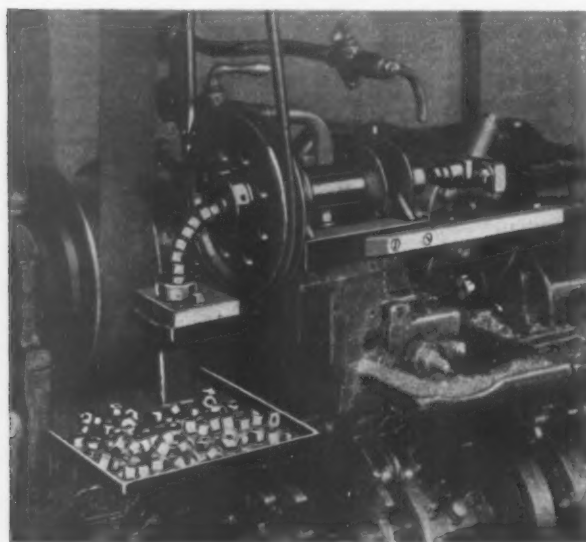
are set just far enough apart so that the belts fit the grooves without either tension or slack, and in having the belts fit in this manner it is claimed that there is no slack nor lost motion in the drive. It is stated that because of the Vee construction, the belts cannot slip, as the harder the pull the more firmly the belts grip the grooves. It is also pointed out that being elastic and stretchable, they cannot jerk, either in starting, acceleration or running, nor can they transmit vibra-

tions, but act as cushions between the driving and driven machines.

Unusual smoothness of power transmission is claimed for the Texrope drive, and due to the absence of belt tension, bearing pressures are low. Simplicity, compactness, durability and silent operation are other features stressed and it is said that the drive is unaffected by moisture or dirt. Units ranging in size from $\frac{1}{2}$ to 250 hp., with ratios up to 7 to 1 and belt speeds from 800 to 6000 ft. per min. have been placed in service in a variety of industries.

Nut Threading Attachment for Automatic Screw Machines

A device for threading nuts and other small parts as they are being formed in automatic screw machines, eliminating the use of the reverse drive and the separate tapping machine, is shown in the accompanying illustration. It is called the automatic nut threading attachment and is being placed on the market by the



Nut Threading Attachment on Brown & Sharpe Automatic Screw Machine

Automatic Nut-Thread Corporation, 24 West Tupper Street, Buffalo.

The attachment is used in conjunction with the transfer arm of the Brown & Sharpe slotting attachment, tapping the nuts or other parts as they are formed and cut off. It is available at present only for the Nos. 00, 0 and 2 Brown & Sharpe automatic screw machines, but the same attachment for use on screw machines of other makes is being developed.

In addition to the saving in cost from eliminating the necessity of sorting the blanks from the scrap in the pan, cleaning and taking them to a separate tapping machine, the device is said to eliminate tap breakage. In producing nuts of full thread and tapped square with the face, rejections are minimized.

The operation of the attachment is as follows: A plunger fitted to the slotting attachment arm enters the blank nut as soon as it is drilled, and when the nut is cut off, immediately swings the blank nut over to the threading attachment, which takes the place of the usual slotting attachment head on the automatic screw machine. As the transfer arm reaches the upright position, it pushes the blank forward into a hexagon socket or chuck, which revolves around the tap. The nut is carried automatically on to the tap, passes through a hollow spindle, and slides out at the end of the tap shank, the dropping of the nuts being controlled by a special sleeve arrangement so that the tap, which is of the floating type, is always full of the nuts. The end of the taps are bent 90 deg. Simplicity and sturdiness of construction are features of the attachment. The spindle runs in ball bearings and adjustments can be made conveniently.

Johansson Gages to Be Manufactured by Standard Gage Co.

The C. E. Johansson, Inc., division of the Ford Motor Co., Detroit, has discontinued manufacturing for sale Johansson snap and plug gages and other gaging devices, except Johansson blocks and accessories, the machinery and equipment used for the manufacture of these gages having been sold to the Standard Gage Co., Inc., Poughkeepsie, N. Y. The latter company, which was organized recently with a capital of \$50,000, will also be the sales agents in the United States and Canada for Johansson standard gages.

Erik Aldeborgh, who for the past eight years has been factory manager of C. E. Johansson, Inc., Poughkeepsie, will have charge of the manufacturing activities of the Standard Gage company. The services of many of the manufacturing personnel of the Ford company's Poughkeepsie plant, has been engaged to assure the continuance of the accuracy of product and quality or service given heretofore. Orders for plug and snap gages received by the C. E. Johansson, Inc., division of the Ford Motor Co. will be referred to the Standard Gage company for execution.

Molybdenum Steel Balls Used in Bearings

Increased toughness and breaking strength, greater and more uniform hardness, which characteristics are claimed to provide unusual load-carrying capacity and maximum ball endurance, are stressed by Standard Steel & Bearings, Inc., Plainville, Conn., in announcing the use of forged molybdenum steel balls in their ball bearings. The dense, fine-grain structure and cleanliness of the steel used is said to assure consistently high capacity and endurance qualities.

Laboratory and service tests on the molybdenum steel balls have been conducted by the company for the past four years. As the demand for greater capacity in ball bearings has been limited to the larger sizes, the company now use a chrome molybdenum electric furnace steel for balls, 1 in. in diameter or larger.

Special Chuck for Holding Gears

A special three-jaw universal chuck for use in the manufacture of gears has been added to the line of the Skinner Chuck Co., New Britain, Conn.

The body, rack and pinions of the chuck, which is



The Top Half of the Chuck Jaw Is Adapted for Holding Gears on Pitch Line

shown in the accompanying illustration, are of heavy construction to withstand strain. A two-piece jaw is employed, as shown, the top half of the jaw being adapted for holding the gears on the pitch line. The top half of the jaw is adjustable in two directions. This makes it possible to hold gears with either an even or odd number of teeth and to true them up accurately. The chuck is available in sizes to hold gears ranging from 3 to 42 in. in diameter. If desired the chuck can be made dustproof so that in grinding the bore of the gears abrasive dust cannot penetrate into the working parts and cause undue wear.

Testing Society's Metal Committees

Fall Group Sessions in Cleveland Largely Attended

—Work of Corrosion and Steel Committees

—Wrought and Malleable Iron

THE development of extensive plans for corrosion tests of metallic-coated products was an outstanding feature of the three-day meeting of committees of the American Society for Testing Materials held in Cleveland, Oct. 27 to 29. This was the fourth of this type of group meetings held by the society and was declared to have been the most successful one. There was a registration of 275, or larger than at any of the previous group meetings. Sessions were held by about 15 main committees and many of their sub-committees, about one-half in the metal field. All the sessions were held at the Hotel Cleveland.

Two dinner meetings were held. At the dinner of Tuesday, President W. H. Fulweiler and Vice-president J. H. Gibboney were the speakers. Following the dinner Wednesday Dr. Charles S. Howe, president Case School of Applied Science, Cleveland, addressed the guests. Dr. Zay Jeffries, Aluminum Co. of America, Cleveland, presided at the first dinner and Prof. H. M. Boylston, Case School of Applied Science, presided at the second dinner. Professor Boylston was chairman of the general committee on arrangements and entertainment. It is probable that the next group meetings in the spring will be held in Providence, R. I., where the textile committee will act as host.

Corrosion of Steel

At a meeting of the committee A-5, on corrosion of iron and steel, announcement was made of the organization in New York, Oct. 9, by national organizations interested in zinc-coated products, of a sectional committee on specifications for zinc coatings for iron and steel. This committee, sponsored by the A. S. T. M., is a new section of the American Engineering Standards Committee and will develop standards for zinc coating. J. A. Capp, General Electric Co., is chairman of the committee, C. S. Trewin, New Jersey Zinc Co., is vice-chairman and S. S. Tuthill, secretary of the American Zinc Institute, is secretary. An executive committee will be organized and the committee will divide its work among seven technical committees covering the following products: Hardware and fastenings, sheets and sheet products, plates, bars, structural shapes and their products, wire products, marine hardware and fittings and one committee on the method of testing.

The activities of committee A-5 on corrosion of iron and steel in both specifications and test work are being closely tied with the broad standardization program of the American Engineering Standards Committee. Committee A-5 is also actively cooperating with the American Society of Refrigeration Engineers in corrosion studies now being conducted by that society.

Work of the Steel Committees

There was no meeting of the general committee on steel, A-1, but various sub-committees of the steel committee held sessions. Sub-committee 19 on sheet steel and steel sheets, J. M. Darke, General Electric Co., Lynn, Mass., chairman, met with members of the Cold Rolled Strip Steel Institute, the meeting being attended by representatives of makers of 95 per cent of the cold-rolled strip producers. The strip steel makers went over specifications that were prepared about six months ago and made minor changes that were approved by the sub-committee. At the same time the changes were approved by representatives of the sheet steel stamping industry. These specifications will be presented before the general committee at its January meeting with the indorsement of practically all the producers and consuming industries.

Sub-committee 2 of A-1 on structural steel for bridges, A. W. Carpenter, New York Central Lines, chairman, decided to look into the possibility of combining two specifications for steel for locomotives and cars which, if made, will mean slight modifications in the specifications.

Sub-committee 22 of A-1 on pipe flanges and fittings, V. T. Malcolm, metallurgist, Chapman Valve Mfg. Co., Indian Orchard, Mass., considered specifications for forged flanges and fittings and also specifications for pipe for high-temperature service. These will be presented before the steel committee at its January meeting. This is a continuation of the work taken up by the sub-committee last year when it presented specifications for castings and for alloy steel bolting material for high-tension service.

A new committee was organized on metallic materials used for electrical heating with Dean Harvey, material engineer of the material and process engineering department, Westinghouse Electric & Mfg. Co., chairman, and F. E. Bash, engineer of the technical department, Electrical Alloy Co., Morristown, N. J., as secretary. At a conference of representatives of interested industries held last June the need for technical study of metallic resistance material used in the manufacturing of electric heating apparatus, operating at relatively high temperatures, was agreed upon. The outcome of this conference was a decision of the executive committee of the society that a new committee should be organized. This committee is composed of both producers and consumers and individual technical interests. The committee will first undertake the preparation of standard methods of testing as preliminary to the investigation of the practice of electric resisting materials and later the development of quality specifications. Five sub-committees were organized to carry on various phases of the work.

Metals at High Temperatures

The joint research committee on the effects of temperature on the properties of metals, sponsored by the Society of Mechanical Engineers and the A. S. T. M., held an all-day session presided over by the chairman, G. W. Saathoff, H. L. Doherty & Co., New York. A report made by the sub-committee on procurement of materials, headed by H. J. French, Bureau of Standards, indicated the desire of manufacturers to cooperate by supplying materials for physical tests. A supply of three types of steel is on hand and these will be heat treated and machined to test specimen shapes and distributed to laboratories. The sub-committee on specifications for high-temperature tests submitted revised forms of specifications for short and long time tests. These specifications as adopted are now in form to be released to the cooperating laboratories, together with sample log sheets, and stress-strain diagram sheets.

The sub-committee on cooperating laboratories, headed by V. T. Malcolm, reported that practically all laboratories addressed expressed a desire to cooperate in these investigations. The report indicated that between 20 and 30 laboratories are equipped to handle high-temperature tests. Twelve of these were selected for the first group of these tests and the test specimens with the tentative specifications for tests will be distributed to them. The present plan of tests is for the determination of the tensile properties of the metals under elevated temperatures. The committee discussed plans, contemplating work on other physical properties of metals at high temperatures, such as the fatigue phenomena, corrosion, erosion, etc. This work will be allotted to other cooperative laboratories. Plans were

formulated for a survey to obtain reports from consumers of their experiences in finding suitable material for use under severe service conditions, involving abnormal temperatures either above or below normal. The need of such a survey was indicated by reports that many laboratories have already worked on these problems and by the fact that the committee has been consulted by users of metals who are in need of information on this subject.

Endurance of Metallic Coatings

The outstanding feature of the present work of committee A-5 on corrosion of iron and steel is an elaborate series of tests of metallic coatings which were first announced early in the year and reported in considerable detail at the annual meeting in June. It is expected that the tests will be completely launched in the near future. This committee meeting, over which J. H. Gibboney, chemist, Norfolk & Western Railroad, presided as chairman, was largely attended. Marked interest was shown in the work and there was a lively discussion of various problems. On the day preceding the general meeting, sessions of the various sub-committees were held.

The committee is taking up first on its program zinc coated articles, including such types of coatings as hot-dip galvanizing, sherardizing, electro-plating and spraying. Following these it will take up such coatings as cadmium plating, aluminum dip, caloricizing, lead dip and tin andterne plate. Parallel to these atmospheric tests there will be a series of accelerated corrosion tests.

Chairman Gibboney reported on the series of field tests of uncoated sheet steels which have been in progress for several years. These are showing additional failures at the Fort Sheridan and Annapolis locations. A detailed report was submitted by the sub-committee on total submersion tests. No conclusive results have as yet been obtained regarding the corrosion of copper-bearing and non-copper-bearing material.

The committee has been observing the corrosion effects in water immersion tests at three locations representing mine, fresh and brackish water conditions. More recently similar tests have been installed in two locations where sea water conditions prevail. These tests have progressed to a point where deductions of value may be drawn. The results do not follow the path of the atmospheric tests and indicate the error of attempting to draw sweeping conclusions from a single set of conditions.

The committee has prepared a tentative specification for galvanized sheets for various uses and is preparing specifications for iron and pipe. Important investigations are in progress on methods of analysis and tests of zinc coatings. It desires also to secure some form of accelerated tests which will be indicative of the probable value of products.

It was announced that the Navy Department will test high-carbon steel under sea water and that the sub-committee plans to test ship plates and different grades of rivets and high and low-carbon sheets under sea water. It was suggested in the discussion that there are other factors besides carbon content to be taken into consideration, such as high sulphur and phosphorus. It was brought out also that in service tests in the South copper-bearing tubes showed the best service with the copper content of 1 per cent. The effect of the copper began to appear with 0.5 per cent copper content and decreased when the content reached 1.5 per cent.

Sub-committees reported that they had been working on a base metal for galvanized sheets but had not found it practical to make standard specifications, that a program of testing sherardized coatings had been laid out, with products of different manufacturers and different coatings to be tested, and that progress is being made in the work of adopting a standard coating for galvanized pipe.

Wrought Iron

A largely attended meeting of committee A-2 on wrought iron was held in connection with the group committee meetings. H. J. Force, chemist and engineer

of tests, Delaware, Lackawanna & Western Railroad, presided. The principal topic of discussion and one in which the members showed a great deal of interest was research work. One of the matters that the committee is investigating is the effect of annealing on the properties of stay-bolts. Another study that is being undertaken is the effect of phosphorus in wrought iron. It was brought out that phosphorus is both in the iron and in the slag and the committee plans to develop a method of analysis to determine the amount of phosphorus in both the iron and slag. This committee also considered modification of all standard specifications for wrought iron, particularly those specifications that apply to the tensile strength and elongation requirements.

Dr. James Aston, metallurgist A. M. Byers Co., Pittsburgh, and G. H. Woodroffe, metallurgical engineer, boiler tube department, Reading Iron Co., Reading, Pa., were elected vice-chairmen of the committee.

Malleable Castings

Committee A-7 on malleable castings, W. P. Putnam, Detroit Testing Laboratory, Detroit, chairman, held a joint session with the committee on malleable iron of the American Foundrymen's Association. The principal point of discussion was upon the question of specifying the value of yield point of malleable iron in the A. S. T. M. standard specifications for malleable castings. At its June meeting the society tentatively accepted a proposal by the committee that a value for yield point be fixed at 30,000 lb. per sq. in. At that time there was some question about the accuracy of determining the yield point by the drop-of-the-beam method. Consequently it was decided that the divider method should be specified as an alternate method. The request for yield point comes from the desire of engineers using malleable castings to base their design upon yield values of the material in conjunction with the ultimate tensile strength and not simply upon the latter alone.

Impurities in High-Speed Steel

The research committee on the effect of tin and arsenic on high-speed tool steel, H. B. Hoffman, Columbia Steel Co., chairman, reported that it had decided to use high-speed tool steel as the basis of arsenic and tin investigation because the bulk of tungsten goes into this product. The data so far obtained on the effects of arsenic and tin in steel show that they are detrimental. However, the published data with reference to high-speed steel are very limited. As many of the tungsten ores contain varying amounts of arsenic and tin and, feeling that these two elements might act entirely differently in a martensitic structure as in a hardened high-speed steel than would be the case in a low-carbon or pearlitic structure, it was decided first to make test heats of steel of three compositions to be melted in crucibles. The work will be divided among the five members of the committee and will include the testing of the steel made into twist drills, cutters and reamers.

Non-Ferrous Metals

Reports of various sub-committees were reviewed at a meeting of committee B-2 on non-ferrous metal and alloys, presided over by its vice-chairman, W. H. Bassett, American Brass Co. The sub-committee on sand cast metals and alloys submitted four tentative specifications for consideration. One covered an aluminum bronze with a 7 to 11 per cent aluminum content, the material of higher aluminum content requiring heat treating. Two specifications are for valve bronze, one an 88-8-4 composition and the other the well-known 85-5-5-5 composition. The fourth tentative specification is for ordinary brass castings. The sub-committee on white metal recommended the advancement to standard of the tentative specifications for white metal bearing alloys (Babbitt metal). The sub-committee on light metal and alloys announced that it will present with the committee's next annual report an article on duralumin and the newer light silicon aluminum casting alloys or modified alloy.

Sees Larger Farm Equipment Demand

Increase of Nearly One-Fourth Expected in 1925 Business as Against Previous Year
—Much Potential Demand Yet to Be Tapped

CONDITIONS in the farm implement industry are better than at any time in four years and even better business may be expected in the near future. This is the consensus of opinions expressed by speakers at the thirty-second annual convention of the National Association of Farm Equipment Manufacturers held in Chicago last week.

Belief is general that a great deal of potential demand for new equipment is waiting to be released in accordance with the prosperity of the farmer.

Farm debts are being liquidated and recent reports indicate an upward trend in land values. The purchasing power of the farm dollar is now 93, and the purchasing power of six major agricultural products is well above a parity with the pre-war average. It was the general impression that the buying movement would continue steadily but that a boom in implement purchasing is not in evidence.

Finley P. Mount, president of the Association and president of Advance Rumely Co., La Porte, Ind., quoting from a bulletin of the Department of Agriculture, said that, "The increased efficiency in accomplishing farm work has greatly enhanced returns from farming and has released large numbers of workers from agriculture to other industries. Most of the machinery now used in agriculture has been developed to the point where it not only saves human labor, but in most cases will do the work considerably better than it can be done by hand methods." He said that in the farm implement industry there is much yet to be accomplished. First of all, every effort must be bent toward improving the efficiency of both product and shops. Costs must be reduced, if this industry would continue to hold a preferred position both at home and abroad.

Standardization Necessary

THE United States is a free and unrestricted market and is subject to invasion at all times by any foreign manufacturer who can produce more cheaply than we can produce. One of the simplest ways to cut costs is further to standardize sizes and types of machines. In this way the industry will not only help itself but will contribute still further to the ability of the American farmer so to reduce his costs that he too can meet foreign competition both at home and abroad. He urged that the brakes be put on long terms, which have become the bane of the industry. They have already caused a high rate of mortality in the ranks of the industry, and threaten still further disaster unless curbed and brought within the limits of reasonable merchandising.

Speaking of the future, Mr. Mount said that the industry at times had become discouraged to the point

of believing that a demand did not really exist and would never materialize, but the year just closing has demonstrated that this demand is there and only awaits a little more farm prosperity to continue its satisfaction. Real farm prosperity is more nearly a fact today than for many years.

No New Types Necessary

A. E. McKinstry, vice-president International Harvester Co., Chicago, in discussing progress in the development of farm equipment, reviewed briefly some of the more recent developments showing the advance the industry has made and is making as a whole. He said, "There have been very few, if any, new crops grown by American agriculture during the last quarter of a century requiring new lines of equipment. The problem has been largely one of improving old machines and developing additional machines to reduce farm operating costs and heavy labor."

"The introduction of the tractor has sent a thrill of new life through agriculture. The great difference between our present civilization and the previous civilizations is that we use mechanical power while they used animal power, and, before that, man power. Agriculture is the last industry to be put on a mechanical power basis. The farmer is now on an equal footing in producing commodities to be exchanged for the products of other workmen who have long supplanted or supplemented their own muscles with mechanical energy."

"Too Many Machines With Handles"

"IT is true that many farmers do not use more modern equipment because they cannot afford it, or because the acreage farmed does not justify it, but it is also true that more farmers do not use it because they have not realized that it is poor economy and poor business to cling to an old, obsolete, and perhaps badly worn machine, when a new machine of greater capacity would materially cut down costs. They have not yet grasped the significance of saving time. The fact remains that the country has too much small-capacity equipment. There are still too many implements with handles on them instead of seats."

Executive Chairman E. J. Gittins, vice-president J. I. Case Threshing Machine Co., Racine, Wis., said, "The standardization committee has made progress during the year. Accomplishments are evidenced by the 'Plow Bolts Standards' published by the Division of Simplified Practice of the United States Department of Commerce. A related set of standards enacted by our bolt and nut committee are those covering standard carriage and machine bolts and wrench openings. Final

Machinery Exports May Total \$40,000,000 This Year

DR. JULIUS KLEIN, speaking before the National Association of Farm Equipment Manufacturers in Chicago last week, stated that "Europe's purchases from the United States this year will probably approach the formidable figures of \$2,700,000,000, comprising not only the staple raw materials—wheat, cotton, copper, oil, etc.—but a rapidly increasing proportion of fabricated wares. No less than 30 per cent of our total exports of the latter group, he said, now go to Europe, and with the new needs of the Old World for reconstruction equipment, it would not be surprising to find our sales of machinery for 1925 approach \$40,000,000 as compared with \$27,000,000 in 1913."

recommendations have been formulated and submitted to the Division of Simplified Practice and are ready for publication.

No Hope of Lower Costs

"THERE is nothing in our present general situation to justify a hope that costs will be lower in the near future. On the contrary, there is a strong tendency toward higher levels. The outstanding factor in the consideration of all costs is that of labor. There is nothing in the present labor situation to indicate lower rates. The contrary is the situation. The National Industrial Conference Board, in its service letter of Oct. 12, points out that their monthly surveys show there is a constantly upward trend in labor rates. In some industries substantial gains in July and August were registered, and a slight gain since then.

"A recent limited survey made by the Research Department shows that in some lines of farm machinery the increase of domestic sales this year, as compared with 1924, is quite large, while in other lines of equipment the increase is nominal. The average increase of all equipment sales may reach 25 per cent. The increase is not because of corresponding increased agricultural income. The increased income this year will probably not greatly exceed that of last year. Business with agriculture, however, has benefited because of the

banked-up need, the balancing and stabilizing of prices, and therefore the restoration of confidence. The need for more and better equipment has been pyramiding since 1920, and as other factors in the situation are favorable we are justified in anticipating a further increase in 1926.

"The improved conditions in foreign countries are being reflected in increased demand for our equipment. Even Europe seems to be finally moving toward better stability and we are beginning to feel the pull for more of our efficient farm equipment."

D. Julius Klein, director Bureau of Foreign & Domestic Commerce, Washington, addressed the Association on the subject of International Trade rivalries. He said that the American steel industry is able to hold its own in the world's open markets in the face of any reviving competition because of our mass production and greater efficiency in management.

Dr. Klein stated that our present steel ingot production is just under 60,000,000 gross tons, or considerably more than all of the rest of the world put together. American pig iron capacity was rated at 53,000,000 tons, which, it was declared, is likewise more than half of the world's total. An abstract follows.

Watch Export Markets Closely

BY DR. JULIUS KLEIN

"WE cannot direct the strategy of our international commercial operations unless we have the most timely and precise data as to where the various openings for our commodities are occurring or might develop. The blind spots in our operations are still far too frequent. Take, for example, the Near East where the gradual stabilization of conditions is offering unusual opportunities to American merchants. Unless we move rapidly in that territory, the prestige which we have been enjoying of late in that section will have dwindled, and the recent resentments against some of our European rivals will have likewise disappeared. There is still room for more vigilant observation of the opportunities in the East Indies where reviving German, Belgian and other continental activities are pre-empting attractive markets which might well have been taken over through American enterprise.

"Certainly the tremendous increase in the investment of American capital abroad which has arisen from \$2,000,000,000 to more than \$9,000,000,000 in the past decade offers a substantial reason for the exploitation by American merchants of the trade openings afforded in many cases in connection with these new investments.

"Not only should this careful scrutiny be applied to the prospects for new trade openings, it should by all means be extended to the machinery or personnel through which we propose to capitalize these openings. In other words, there is need now as never before for the most rigorous appraisal of our agency or distribution arrangements. With the revival of European trade, it is becoming increasingly evident that many European agents employed as distributors by American companies in the Far East and Latin America are turning back to their old European connections. American merchandise was gladly handled and pushed to the limit by these representatives as long as there was no definite prospect of a connection with their own nationals; but with the reviving strength of the latter, it is quite natural to find a renewal of relationships with their kin in the home land. In many markets there are no American or native distributors available which reduces the American exporter to the necessity of employing European connections. But the changing con-

ditions in the old countries is bringing out more clearly every week the necessity for the utmost care in checking up the activities of such European distributors of American wares.

Good-Will Should Be Guarded

"THERE is another phase of this agency situation which will require careful attention. During the readjustments and managerial alterations in many important industries in the United States since 1921, there has been all too frequent a tendency to make radical and entirely unnecessary changes in overseas distributive organizations. The utmost care should be exercised in avoiding those tragic losses in good-will which have been unfortunately caused by the hasty shifting of plans of American companies whose operations in foreign trade have been more or less haphazard. With proper attention to these vital factors of accurate data on trade openings and on agency arrangements, the prospect for effective advancement of our overseas economic interest seems assured regardless of European rivalries.

"Perhaps the most gratifying index of this is found in the marked improvement in export technique which is evident in all parts of the country. The 7000 queries on foreign trade problems which are now being submitted to the Department of Commerce every day represent not only a ten-fold increase in number over the last four years, but an equally notable advance in the quality and intricacy of the problems submitted. There is far greater care exercised in the scrutiny of trade statistics on the part of our trading community; market researches are being carried on with much more expert attention to details, and even in the matter of improving agency relationships, it is significant that whereas about 72,000 lists of desirable foreign buyers were requested by business men from the Department in the fiscal year 1921-22, that number was increased to over 687,000 in 1924-25. Definite steps are being taken to simplify and standardize bills of lading, letters of credit and other trade documentation through the agency of commercial organizations represented by the 68 trade committees collaborating with this Department."

Need of Hour Is Human Engineering

Marvelous Results in Mechanical Engineering Have Been Achieved—Development in Handling Men as Important

BY CHARLES M. SCHWAB*

IT is common to refer to the period in which we live as the Age of Steel. Some people call it the Machine Age. Our civilization is referred to as "industrialism." Socialists sometimes call our organization of society "capitalism," meaning that capitalists have control of the tools of industry. But it all means the same thing: We live in a period which could not be what it is without steel. Did you ever think where the world would be if you were to take all the steel out of it?

Did you ever think how difficult it would be for the world to progress along material lines if we did not have steel, steel to build our railroads, our tunnels, bridges, buildings, ships and machines? And yet it is only a little over 60 years ago when, in 1864, the Bessemer process of making steel was invented. When I started in the steel business myself some 50 years ago, the United States was producing less than 1,000,000 tons of steel a year.

I remember when the Steel Corporation was formed in 1901, we were producing less than one-fourth of the amount of steel we are producing today. In other words, production of steel has increased four-fold in less than 25 years, whereas during that same time our population has increased less than 50 per cent.

Let us look around us and think of the opportunities for development in our own country: Think of the railroads that are to be built and improved, think of the buildings that are to be erected, the bridges that are to be built, the rivers and mountains that are to be tunneled, to say nothing of the requirements for steel for automobiles, airplanes, machines of every kind, the necessary wear and tear requiring constant replacement. When we contemplate these things we will get some conception of the possibilities ahead in the development of steel. Then let us take a broader view. Think of the world, the undeveloped possibilities in South America, Africa and Asia, and the part America may play in developing the untold resources of those great countries; when we consider such facts as these, we cannot but realize that those who produce steel have possibilities open to them undreamed of in the years that are gone.

Always an Optimist

At Bethlehem we developed a marvelous plant for the production of munitions for war requirements. Today that plant is being used 99 per cent for the implements of peace. All of Bethlehem's investment in new properties and new advancement is in full confidence that the years to come will be years of peace. We have scrapped a huge armor-making plant. And we are today building fearlessly and investing money con-

fidently, rounding out our plants, in the belief that the years immediately ahead of us will witness developments in the steel business of greater magnitude and offering greater possibilities than anything we have ever known before.

Of course, two great problems confront us. One is the necessity for reducing costs, the need for scientific management and economical operation. The other is the importance of developing men. We have done marvelous things in the direction of mechanical engineering; not the least of the needs of the hour is development of the art of human engineering, the art of enabling men to get greater results in both achievement and happiness out of their work than ever before.

Sales Costs Must Be Cut

MANUFACTURERS cannot expect to continue to be prosperous in this or any other country unless they study economy and the possibilities of cutting costs to a degree never before considered necessary. These costs must be cut not merely in manufacturing, but in the expense of selling goods. Take the automobile business, for example: There is tremendous extravagance growing out of the competition to sell cars. The public today is paying an enormous percentage of the cost of automobiles which is not represented by the value of the car itself. That is true in a great many lines of industry.

And I would like to add a word about the importance of human engineering. In this Machine Age of ours we have thought a great deal about the perfection of the machine; we have devoted less attention to the perfection of the human being. The consequence is that many people today are saying that our modern industry has erected a gigantic mechanical structure which some day will wreck us unless we know how to get on top of it.

Altogether too many men have to do routine jobs unrelieved by variety or change of scene. I believe that a man gets his greatest joy out of work and I have no patience with those who think that men are going to be happier when they have to work only four or five hours a day. I am happiest when I am working, and I believe every other man gets his greatest joy out of real achievement. We have got to work out a plan, however, whereby men, even in the subordinate ranks of life, may obtain that sense of achievement out of performing routine tasks.

We have got to devote ourselves to the problem of making men happy not through making life soft and easy, but through so using the implements and the facilities which science has placed at our disposal as to enable men, through their work and out of their work, to realize a larger life and take a greater zest in their workmanship.

*Abstract of address of Charles M. Schwab before Conference on Education and Industry, University of Chicago, Oct. 21.

"I have never seen the manager of any establishment, however able and however great he was, who effected true economy in his business by having a general survey of his business every day or every hour," stated Charles M. Schwab, in an address delivered recently at Chicago to the twentieth annual convention of the Institute of American Meat Packers. "It is the man who will take one detail of his business and study it to finality, and say of that detail, we can make it no better, and thence from one detail to another and he will accomplish real economy that the general supervision of a business will never accomplish."

"It is the attention to individual items of cost in detail, added together, that will make the successful and established business of today."

September Machinery Exports Lower

Drop of \$8,000,000 Accounted for Largely by Loss of \$5,500,000 in Agricultural Machinery

WASHINGTON, Oct. 31.—Exports of American machinery in September were valued at \$30,719,342, as against \$38,768,823 in August. The value for September was a little more than \$6,000,000 in excess of the value for September of last year, with a total of \$24,460,196. For the nine months ended with September, machinery exports were valued at \$286,041,452, a gain of more than \$45,000,000 (19 per cent) over the corresponding period of last year.

Exports of metal-working machinery in September numbered 2804 tools, valued at \$987,379, as against 5240, valued at \$1,308,372, in August. September is the first month since February which has failed to exceed \$1,000,000.

Imports of machinery into the United States in September were valued at \$956,250, as against \$747,912 in August. The value of incoming shipments of machinery in September was the highest since April

of the present year, with \$1,167,099. The September inward movement was more than \$200,000 above the value of imports of machinery in September of last year, when the amount was \$746,485. For the nine months ended with September, machinery imports were valued at \$8,187,045, or more than \$1,000,000 over the corresponding period for last year, when the aggregate was \$7,107,257.

The decline in value of machinery exports in September under August was due largely to the striking decrease in outgoing shipments of agricultural machinery. The value of this class of equipment exported in September was but \$5,800,532, against \$11,318,423 in August, when a record was set. For the nine months, agricultural machinery exports, at \$60,531,337, have exceeded the 1924 nine months, \$47,640,850, by 27 per cent.

In many lines gains were shown in exports of machinery in September over August, some of them of a substantial character. Among such gains were those in shipments of steam and electric locomotives, automobile engines, and mining and quarrying machinery. However, there were some sharp reductions in shipments in September, among them being internal combustion engines and oil-well machinery. Of the steam locomotives exported in September, to the value of \$521,235, Canada took 10, with a value of \$364,089, while for the nine months ended with September, 35, with a value of \$594,298, were shipped to Canada. Four locomotives, valued at \$60,374, were shipped to

United States Exports and Imports of Machinery

	Exports of Machinery	Imports of Machinery	Exports of Metal Working Machinery
1924			
September	\$24,460,750	\$746,485	\$575,460
October	28,094,797	604,226	834,806
November	25,502,430	1,354,600	715,327
December	22,796,442	643,318	867,616
The year	317,034,987	9,711,571	8,644,444
1925			
January	28,117,952	803,829	845,986
February	23,215,776	814,703	707,445
March	35,962,076	999,237	1,364,930
April	36,033,980	1,167,099	1,245,634
May	32,164,865	861,655	1,230,914
June	28,746,061	935,487	1,003,325
Fiscal year	338,715,075	10,404,337	10,776,079
July	32,320,533	905,872	1,188,069
August	38,768,823	747,912	1,308,372
September	30,719,342	956,250	987,379
Nine months	286,041,452	8,187,045	9,882,054

Imports of Machinery Into the United States (By Value)

	Sept. Ending Sept.		Nine Months Ending Sept.	
	1925	1924	1925	1924
Metal-working machine tools	\$16,499	\$15,056	\$283,010	\$266,792
Agricultural machinery and implements	288,886	134,272	2,533,299	1,861,190
Electrical machinery and apparatus	94,675	45,220	636,382	341,611
Other power generating machinery	322	558	7,577	84,221
Other machinery	433,501	405,305	3,365,016	3,088,920
Vehicles, except agricultural	122,367	146,074	1,361,761	1,464,523
Total	\$956,250	\$746,485	\$8,187,045	\$7,107,257

United States Metal-Working Machinery Exports

	September, 1925		August, 1925	
	No.	Value	No.	Value
Lathes	117	\$184,401	129	\$307,652
Boring and drilling machines	90	47,684	474	87,679
Planers, shapers and slotters	13	23,574	26	63,724
Bending and power presses	40	69,151	40	39,145
Gear cutters	23	68,926	22	64,041
Milling machines	78	109,630	125	208,230
Thread-cutting and screw machines	69	116,435	123	113,535
Punching and shearing machines	9	6,392	36	16,004
Power hammers	5	3,717	16	16,490
Sharpening and grinding machines	103	245,349	117	275,470
Chucks, centering, lathe, drill and other metal-working tools	947	25,259	3,015	34,166
Pneumatic portable tools	1,310	88,861	1,117	82,236
Total	2,804	\$987,379	5,240	\$1,308,372

Machinery Exports from the United States

	September, 1925	September, 1924	Nine Months Ended September, 1925	
			September, 1925	September, 1924
Locomotives	\$521,235	\$1,417,136	\$4,175,139	\$3,854,738
Other Steam Engines	255,164	212,853	1,712,337	1,594,443
Boilers	181,922	218,139	1,588,953	1,563,267
Accessories and Parts	194,367	172,007	1,516,130	1,350,954
Automobile Engines	1,402,322	204,081	12,976,141	2,666,189
Other Internal Combustion Engines	526,657	428,153	3,995,806	4,906,268
Accessories and Parts for	356,632	236,366	3,140,072	2,760,558
Electric Locomotives	56,783	468,634	361,825	2,137,279
Other Electric Machinery and Apparatus	633,425	534,967	5,121,030	6,005,528
Excavating Machinery	290,478	189,590	2,707,112	1,864,010
Concrete Mixers	50,448	49,288	578,949	498,300
Road Making Machinery	97,569	47,203	1,070,226	893,239
Elevators and Elevator Machinery	165,278	224,833	1,654,651	1,490,613
Mining and Quarrying Machinery	663,046	537,135	7,452,844	7,414,468
Oil Well Machinery	592,125	440,513	7,256,005	4,994,906
Pumps	662,206	600,076	5,542,026	5,373,171
Lathes	184,401	78,757	1,839,338	858,376
Boring and Drilling Machines	47,684	49,891	533,202	421,618
Planers, Shapers and Slotters	23,574	17,201	463,134	222,282
Bending and Power Presses	69,151	33,954	479,761	237,905
Gear Cutters	68,926	19,088	652,694	291,343
Milling Machines	107,630	71,013	1,255,209	408,458
Thread Cutting and Screw Machines	116,435	33,299	837,303	443,682
Punching and Shearing Machines	6,392	2,937	165,877	70,019
Power Hammers	3,717	36,139	192,099	187,073
Sharpening and Grinding Machines	245,349	134,770	2,388,265	1,562,002
Other Metal Working Machinery and Parts of	370,890	320,862	4,128,315	3,130,868
Textile Machinery	1,116,807	681,164	8,289,624	6,594,318
Sewing Machines	572,223	672,890	6,556,662	6,489,193
Shoe Machinery	111,651	108,643	1,065,988	996,883
Flour-Mill and Gristmill Machinery	13,291	9,987	161,908	171,488
Sugar-mill Machinery	1,142,723	1,109,782	5,266,621	5,100,798
Paper and Pulp Mill Machinery	169,550	83,983	1,105,968	1,626,208
Sawmill Machinery	54,986	41,350	577,931	393,209
Other Woodworking Machinery	97,229	63,284	1,039,436	985,712
Refrigerating and Ice Making Machinery	178,276	159,612	1,654,295	1,726,562
Air Compressors	359,846	220,493	2,960,483	2,243,354
Typewriters	1,384,812	1,310,170	13,145,092	11,263,740
Power Laundry Machinery	62,400	75,824	801,986	762,501
Typesetting Machines	240,244	214,837	2,608,184	2,431,056
Printing Presses	373,462	289,197	3,573,790	3,269,222
Agricultural Machinery and Implements	5,800,532	5,574,742	60,531,337	47,640,850
All Other Machinery and Parts	11,147,504	9,065,352	102,918,001	92,156,753
Total	\$30,719,342	\$24,460,196	\$286,041,452	\$240,643,404

Cuba in September, while the nine-months shipments to that country were 19, with a value of \$384,983.

Of foreign shipments of sewing machines to the value of \$572,223, 1850, valued at \$94,314, went to the United Kingdom, while for the nine months ended with September, sewing machines to the number of 24,294, with a value of \$1,385,345, were exported thence. Mexico in September took 2635 sewing machines, valued at \$77,757, and for the nine-months period took 33,382 machines, valued at \$892,288. Shipments to Brazil in September numbered 2714, valued at \$75,209, while for the nine months Brazil took 17,711 machines, valued at \$561,072. Colombia took 2381 machines valued at \$65,802 in September, while for the nine months that country took 12,393 machines valued at \$343,392.

Exports of typewriters in September were valued

at \$1,384,812, the United Kingdom taking 5365, valued at \$286,296. For the nine months ended with September the United Kingdom took 47,054 typewriters, valued at \$2,534,742. Typewriters exported to France in September totaled 2009, valued at \$125,283, and for the nine months they numbered 22,752, with a value of \$1,357,382. Brazil took 1034, valued at \$67,073 in September, and for the nine months took 9431, valued at \$593,054.

Exports of printing presses in September were valued at \$373,462, South America taking 23, valued at \$101,331. For the nine months shipments to South America totaled 145, valued at \$366,969. Printing presses exported to the United Kingdom in September numbered 20, with a value of \$64,173, and for the nine months the number was 144, with a value of \$459,673.

SWEDISH STEEL TRUST

Plans Run Afoul of Quota Dispute—None of the Leaders Interested

BERLIN, GERMANY, Oct. 9.—The depressed condition of Sweden's iron industry, as described from here in a despatch to THE IRON AGE of Aug. 18, and the failure of producers to gain increased production, led some time ago to preparation of a plan for a steel trust, somewhat on the lines of the German Western Trust now being negotiated. This plan has been published, somewhat to the disappointment of steel men, who expected a big and comprehensive fusion. It is announced that eight companies have decided to amalgamate.

Sweden's iron and steel industry has two distinct sides, consisting of production of fine quality products, which are in considerable demand abroad, and in trade iron and steel consumed at home. Four of the fusing concerns, Fagersta, Forsbacka, Hellefors and Kloster, belong to the first group; and four, Kohlswa, Smedjebacken, Horndal and Schebo, to the second. The aim is economy, to be achieved through standardization, and through limitation of each concern to the product for which it is technically best suited.

Quarrels Over Shares

As with all the German new fusions, the respective "quotas," or participation shares in production and profits, are a matter of dispute. There is also, as

with the proposed German steel trust, a certain incompatibility between exporting manufacturers of high-class and expensive products on the one side and smelters of trade pig iron and producers of ordinary steel and rolled goods on the other. The former branch, in particular the foreign selling, is very highly specialized.

The main objection raised in Sweden to the trust is that it is not representative, and cannot therefore claim to control the Swedish industry in either of the two branches. Hardly one of the fusing companies comes into this rank and none of the six leading companies proposes to enter the combine. In this lies the distinction with the German Ruhr plan, which includes, even if Krupp do not join, practically all the leaders.

Decadence of the Industry

A report by the Iron Smelting Association indicates that some remedy must be sought. In the last quarter, states the report, 14 blast furnaces, 19 Lancashire furnaces, 4 Bessemer and 2 Martin (open-hearth) furnaces have gone out of operation. In the first half of 1925 the output of pig iron and semi-finished goods fell by 70,000 metric tons as compared with the same half of 1924. Production of trade iron and steel can be carried on only at a loss. The one sound branch of the industry is that exporting iron ore, particularly to Germany, which exceeds the pre-war volume by 50 or 60 per cent, and is increasing. Sweden's iron production has now fallen to about 1 per cent of the world production, after having once been 38 per cent.

French Shipments to United States

PARIS, FRANCE, Oct. 12.—French iron and steel imports and exports from and to the United States during August and the first eight months of 1925 were as follows:

	Exports		Imports	
	August	8 Months	8 Months	August
	Metric Tons	Metric Tons	Metric Tons	Metric Tons
Pig iron	1,015	2,968	195	....
Blooms, billets, bars, etc.	1,341	3,363	....	....
Rails .....	....	3,829	....	....
Castings	604	11,891	....	....

French Iron and Steel Output in August

PARIS, FRANCE, Oct. 12.—On Sept. 1 there were 141 furnaces in blast (144 on Aug. 1), 35 (33) were ready to be blown in, and 44 (43) under reconstruction or repair.

France produced in August 712,547 metric tons of pig iron (against 724,164 tons in July), or a daily average of 23,000 tons in August (against 23,350 tons in July). The pig iron output in August included 531,096 tons of basic iron (534,699 tons in July), 127,081 tons of foundry iron (133,371), 27,574 tons of forge iron (36,468), 4036 tons of Bessemer iron (3727), and 22,760 tons of special kinds of pig iron (15,899).

The steel output in August was 616,730 metric tons (625,344 in July), or a daily average of 19,900 tons (against 20,160 tons in July). The raw steel out-

put in August (605,384 tons of ingots and 11,346 tons of castings) included 436,574 tons of basic Bessemer (against 452,504 tons in July), 166,931 tons of open-hearth steel (159,398), 6319 tons of electric steel (5721), 5994 tons of acid Bessemer (6844) and 912 tons of crucible steel (877).

Building Conference in Chicago

A national conference of employers in the building industry will be held at the Congress Hotel, Chicago, Nov. 17. Among some of the major problems of the industry the following will be discussed:

- (1) What is the building outlook for 1926?
- (2) Is the present labor supply adequate to meet the demands of the industry and will it meet the requirements of next year?
- (3) Will wage increases for 1926 be justifiable? Demands for advances already have been made in certain localities.
- (4) Does the present apprentice training movement meet the needs of the industry?
- (5) What of the effort of labor to extend the five-day week? Will advances in this direction in certain trades extend to others unless checked at this time?
- (6) What can be done to eliminate those restrictive practices in labor agreements which unnecessarily and unjustly increase building costs?

A. W. Dickson, executive secretary of the National Association of Building Trades Employers, 214 Electric Building, Cleveland, is in charge of arrangements.

Imports of Finished Steel Decline; More Foreign Pig Iron Competition Likely

Advancing Coke Prices Here Widen Margin of European Producers;
Exports of Steel Also Lower in Recent Months

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

DURING September exports of general commodities increased in value, while imports declined. Our balance of trade is still favorable, but is barely half of that of September, 1924. We may reasonably expect a continuation of the tendency toward less favorable trade balances for some time, as we are still in that second stage of the international readjustment process in which our interest rates are relatively low and our prices are relatively high. These conditions tend to encourage imports and to check our exports.

Moreover, the tendency of imports is to follow closely the trend of general business. The trend of imports has been upward since June, after the moderate setback of the second quarter. This parallels the re-

ing is encouraged. Foreign loans increase and American investors become holders of liens on foreign properties. There is a fair prospect that our immediate demands as a creditor nation may be met in this way and that large commodity imports and an unfavorable trade balance may be long deferred.

There is no immediate prospect of losing our exports. They are not so large as they might be, were we still a debtor nation, but it is well to remember that world trade is not yet normal and that we are probably getting a fair proportion of it.

Gold exports have exceeded gold imports every month of 1925 with the exception of July and August, when there were very small import balances. October

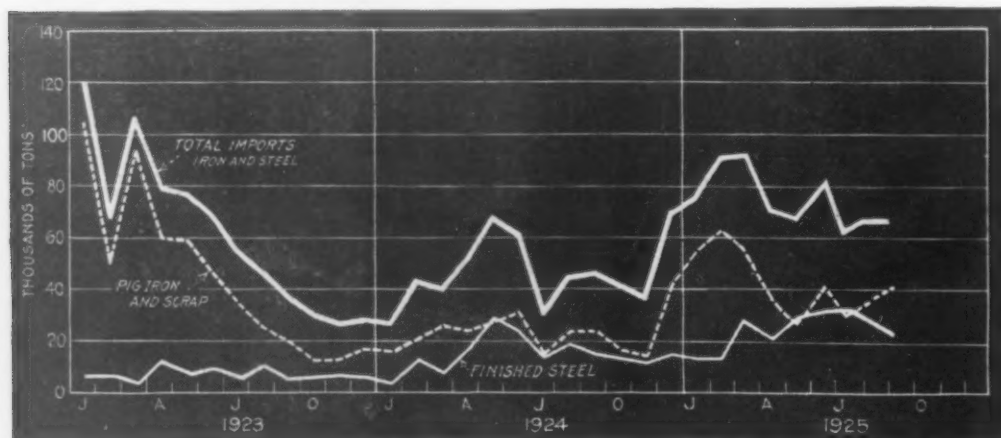


Fig. 1—Imports of Finished Steel Have Shown a Marked Decline While Pig Iron and Scrap Have Been Entering the Country in Increasing Volume

sumption of activity in industry, which is well under way following a minor recession. It is becoming increasingly clear that we are in the upswing of a major business cycle. It follows that some further gains in imports may be reasonably anticipated in the near future.

In particular, exports failed to register the usual seasonal gain in September, so that the adjusted index declined. It was only about 12 per cent above the average for 1921—the lowest point since June.

Foreign Loans Increasing

IMPORTS also made less than the usual seasonal gain. The September adjusted index of imports, however, was about 74 per cent above the average for 1921. Thus imports have increased to a relatively greater extent than have exports during the past four years. In fact, September exports were 1 per cent below those of September, 1924, while imports increased 21 per cent over a year ago.

In spite of these trends, gloomy forebodings of a vanishing trade balance do not seem warranted. Fully one-third of our recent imports have been crude materials. This is encouraging from the manufacturer's viewpoint. Moreover, the fact that we are a creditor nation does not necessarily mean that we will receive payments in goods alone. As long as our interest rates are below those of other nations, foreign borrow-

ing is encouraged. Foreign loans increase and American investors become holders of liens on foreign properties. There is a fair prospect that our immediate demands as a creditor nation may be met in this way and that large commodity imports and an unfavorable trade balance may be long deferred.

Franc Drops Lower

EXCHANGE rates continue to favor foreign trade. There has been relative stability with slight declines recently in both the yen and the pound sterling. An upward trend in the Argentine peso and a sharp advance since May in Brazilian milreis have tended to improve our trade prospects in South America.

The franc still tends downward. A combination of increasing note circulation, unfunded foreign obligations and the fear of a capital levy, threaten to drag the French exchange down to the lowest point in its history. This gives France a temporary but unenviable advantage as far as exports are concerned; but it will tend to make her poorer in the long run, and may cause capital to seek better conditions in other countries.

Finished Steel Exports Smaller

EXPORTS of iron and steel declined more sharply in September than they had increased in August (Fig. 1). As usual, finished steel was responsible for these fluctuations. Pig iron and scrap exports had similar ups and downs in the months mentioned, but were almost negligible in quantity. The September exports

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Close control of carbon content said to be possible with Flodin process.—Tests on metal made direct from iron ore show remarkable results.—Page 1247.

Uncle Sam maintains a machine shop for his post office department.—Produces, among other items, 8000 locks daily for protection of mail bags.—Page 1249.

Large fire tank successfully welded in New York.—Both oxyacetylene torch and electric arc used to complete unique job.—Page 1250.

Marco system simplifies expression of Erichsen and similar measurements.—Expresses relation between "depth of impression" and gage of sheet being tested for drawability.—Page 1251.

Does use of scrap in blast furnace result in poor castings?—Some evidence that complaints against iron so made are not well founded.—Page 1252.

Hidden profits may lie in sales statistics or await analysis of sales problems.—Sales research and sales promotion departments pay a profit to large concerns in metal-working trades. Small concerns can profit, too.—Page 1241.

Machine tools made in America far ahead of European designs.—British users often prefer our product on account of greater accuracy as well as better production.—Page 1272.

Manufacturers should not change export agencies frequently.—Much tragic loss of good will has followed hasty changes of this sort, says Dr. Julius Klein.—Page 1262.

"I have no patience with those who think that men are going to be happier when they only work four or five hours a day."—"I believe that every man gets his greatest joy out of real achievement," says Charles M. Schwab.—Page 1263.

No conditions are present to indicate turn in business tide.—Admitting activity at high rate, what is to prevent a continuance of prosperity?—Page 1270.

Farm implement makers see banked-up demand increasing sales in 1926.—In addition to a 25 per cent increase this year as compared with last.—Page 1261.

October daily pig iron rate gains 7.3 per cent over September.—Six more furnaces in blast at end of month. Total of 3,023,370 gross tons for month exceeds 3,000,000 mark for first time since April.—Page 1274.

Finished steel imports declined during August and September.—Foreign pig iron output recedes, but competition may be keener as domestic coke prices advance.—Page 1266.

American Federation of Labor moves to include old age pensions in employer-labor contracts.—Attempt to convince workers that employer's efforts toward welfare are designed to prevent demand for better wages.—Page 1271.

Claims electric steel superior to iron for staybolt use.—Tests said to show better wearing qualities; say saving by using electric steel would be nearly \$1,000,000 annually.—Page 1243.

Regular tapping of blast furnace plugs with oxygen lance costs less than old sledge-and-bar method.—Also useful in cleaning clogged cinder notch and freeing plugged tuyeres.—Page 1244.

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Where Promptness Is Essential

THE Reader Service Department of THE IRON AGE makes these extracts from subscribers' letters commenting on our treatment of the convention of the American Foundrymen's Association at Syracuse:

"An especially fine feature was the promptness with which the complete report was printed, enabling those who did attend the sessions to go over the various items on the program in detail, and for the benefit of those who could not attend, offering a reading of the proceedings while they were still of interest and not stale news."

"I must say that you were certainly on the job in reporting the Foundrymen's Convention. Your account gives an excellent picture of what went on at Syracuse."

"The promptness with which it was reported is certainly most gratifying."

Reporting news while it is still news is a cardinal principle in covering conventions for THE IRON AGE.

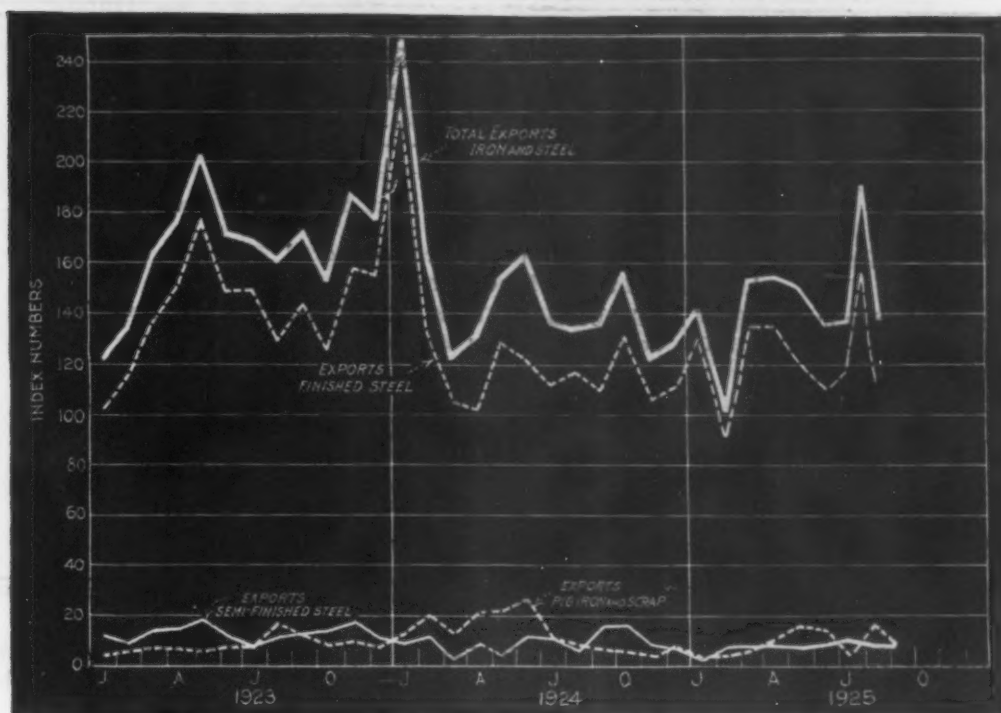


Fig. 2—The Drop in Exports of Finished Steel Has Brought the Total Nearly Down to the Low Point of the Summer

of finished steel were the smallest for any month this year excepting February and June. It may be noted, however, that compared with last year the July and August exports of all iron and steel products were larger in volume, except semi-finished steel, exports of which have been fairly stable.

Imports of iron and steel have on the whole tended downward since February, due at first to a sharp recession in the amount of pig iron and scrap imported after that date, but more recently to a decline in imports of finished steel (Fig. 2). During August and September the decline in imports of finished steel practically offset the gain in pig iron and scrap, leaving the total little changed.

The imports of pig iron and scrap and finished steel are still entering the country in larger volume than was the case during the third quarter of 1923 or 1924.

With weak coal prices in Europe at a time when domestic coke prices are soaring due to the coal strike, it is probable that Europe will sell pig iron at figures below those of domestic producers. Coke price increases are already helping to boost pig iron prices here. This situation will encourage foreign pig iron competition on the seaboard at least.

There is a rough relationship between the volume of general commodity imports and imports of iron and

steel. The same forces working toward larger general imports may to some extent affect those metals.

Our composite index of production of pig iron in five foreign countries has receded from the March peak, but reports from the United Kingdom and Canada show some improvement in September.

While French production of pig iron dropped from the peak of 713,500 gross tons in July to 700,800 gross tons in August, the latter figure with the exception of July, was the highest point in the past five years. Belgian pig iron production reached its peak of 277,200 gross tons in March and its 1925 low of 163,700 gross tons in August.

The production of pig iron in the United Kingdom like that of Canada reached its high point in March, when the total was 607,900 tons. The low point in the United Kingdom came in August when the pig iron output fell to 444,500. A slight gain was made in September to 448,700 tons and prospects are somewhat brighter now. Canadian production gained in both August and September.

Germany seems well stocked in spite of a setback in production. Figures now available show that August pig iron production reached the lowest point thus far in 1925 at 753,800 gross tons, following a decline from the March peak of 974,900 tons.

The Iron Age, November 5, 1925

Prospects for American Automobiles in Germany None Too Rosy

BERLIN, GERMANY, Oct. 14.—The import prohibition against automobiles was removed on Oct. 1 and American exporters have now to face only the much-increased duties imposed by the "Minor Tariff Law." Possibly the maximum duties imposed by this law may be reduced in commercial treaty negotiations with France or Italy. If so, American exporters will share the benefit under the "most-favored-nation" treatment to which the United States is entitled. Meantime the duties seem to be entirely prohibitive, at least for cheap, light cars, the kind which Germany needs. There is little chance that German manufacturers will be able to reduce their production costs materially. When, as the Minor Tariff provides, the duties decrease automatically, America should be able to compete.

Reasons why Germans cannot reduce their production costs much are given by an expert, Dr. Heinz Lud-

wig, as follows: In a German corporation producing 500 cars per month (which is big for Germany) only 24.1 per cent of production cost is spent actually by the corporation in its own works; the remaining 75.9 per cent is spent on purchase from other firms of materials and parts and accessories in various states of preparation. In case of a car costing 5200 marks (which is very cheap for Germany) 3950 marks go outside the actual automobile works. It is impossible to reduce this latter sum without reducing prices in half a dozen industries. And in Germany there is no present possibility of a mass production which would enable the manufacturing corporation either to work up its own materials or to buy semi-finished materials and parts cheaply.

The Ford Motor Co. has purchased two 15-ton Heroult electric furnaces for the cast iron cylinder-block department of the River Rouge plant.

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The Basis of Prosperity

MANY expert and prominent men agree that the people of our country at present are highly prosperous and that there is good prospect of an even greater scale of prosperity. The bull market in securities already has exceeded what is supposed to be the ordinary rhythmic period for such movements, but no end is yet in sight. What do these conditions mean?

Elementally they mean that town labor is well employed, that it is working with a superior degree of efficiency, and that the agricultural community is well employed and is getting good prices for its products. Speaking broadly, we may say that the country is making a large production of goods. High prices and high wages do not necessarily play any part in this. We may have the same production with low prices and low wages and be just as prosperous as with high. Of course, high prices received for goods exported may bring us a larger proportion of goods in return. Moreover, it is not to be denied that high prices and high wages have a powerful effect on sentiment. Nevertheless, the chief bearing of prices and wages is upon the division of income, while the creation of income is solely the product of capital and labor and the extent and efficiency of their employment. Our present prosperity means, then, that capital and labor in this country are both well employed; that neither is loafing to any great extent, either by will or by inability owing to maladjustment of things.

What capital and labor are working for is quite another matter; nor is it sufficient to answer broadly that, of course, they are working to produce good living for the people and the ability to enjoy comforts and luxuries. The people may obtain enjoyment in a variety of ways. The eight million or so who make up metropolitan New York might derive great satisfaction from an improved system of municipal transportation and might work for that. Or they might make up their minds, as apparently they have done, that there is more pleasure to be got out of good roads and automobiles to run upon them. Economists may indicate what the people ought to do; but, in fact, the people will do just what they want to

do. If they want amusement in the form of cinematography, radiotelephony, jazzing, automobilizing and even aeroplaning, they will have it.

Perhaps, therefore, we should not look too much askance upon the furious speculation in motor shares. Cautious speculators and (much more so) conservative investors, will keep out of them, fearing that their present large earnings cannot be maintained. Yet it is possible that this can be done if the people continue determined to have many automobiles and are willing to work for them. As for the public utilities, the rails and the seasoned industrials: those that have not yet been bid up to a 6 per cent basis can hardly be said to be selling too high.

Just now there is a concurrence of many favorable conditions. The farmers have not done so well in more than five years. Alleviation of Federal taxation is assured. Governmental harassing of business has ceased. The courts repeatedly have upheld the rights of capital in the public utility cases. Improvement of railroad service has reduced greatly the quantity of goods in transit and consequently the lock-up of credit in them. Improved knowledge of economics keeps the situation free from the common practice of manufacturers, jobbers and retailers of overstocking goods on a rising market. The requirements of capital for extension of industrial plant are relatively small. Labor generally is contented. Its attitude is often irritating, but we need not mind that so long as it does not lead labor to loaf. The Locarno pact assures peace in Europe. Europe is taking steps to arrange its national indebtedness to us and thus rehabilitate its credit.

Business moves in an undulatory line. Its activity goes up and runs down. But to make it rise there must be reasons, and similarly there must be reasons for a fall. At the present time conditions that will produce a turn of the tide are not in sight.

TWO interesting observations are possible now that monthly statistics of German iron and steel production are again being published. The 1925 output, if the rate for the first eight months of the year is maintained, will be the largest since

the war. Pig iron will approximate 10,835,000 metric tons, with steel roundly at 13,150,000 tons. In 1918 Germany produced 11,863,500 tons of iron and 14,979,500 tons of steel. In 1913, with Lorraine included, the figures were 19,309,000 and 18,935,000 tons. In character of output the changes have been marked. In 1913 about 38.5 per cent of the total steel output was basic open-hearth; thus far this year about 54 per cent is basic open-hearth. Thus in the last year or so Germany has increased her capacity decidedly, evidently by the addition of basic open-hearth furnaces. Before the war basic Bessemer steel predominated; now basic open-hearth has displaced it largely.

Efficiency and Labor Unions

IN the past five years there has been the most spectacular increase in efficiency ever witnessed in a like period in the history of manufacturing in the United States. The peak of inefficiency was reached in that hectic and lamentable year 1920. Nearly every one was out then for the greatest return with the least exertion or service and those who did want to do good work were hampered by others.

In the mental reaction that followed the idea gradually spread that a man would have to do better work to get along, and this applied to employers as well as employees. There had been a decided loss of pre-war efficiency and the first gain was of lost ground. For a couple of years or so employers in scrutinizing results were thinking solely of getting back pre-war efficiency. When the first cases appeared of even better than pre-war results there was no little surprise.

It is not contended that in every case as good work is now being done as before the war. The net or total result for the country is what is considered. In many cases the individual workman does not strive so hard, but he is so assisted by improved equipment, methods and surroundings that the product is greater. No class has benefited more by this improvement than the ordinary or typical wage earner. The profits of manufacturers and dealers have decreased while the buying power of a week's wages is greater than before the war.

Numerous influences have contributed to the increase in efficiency, but it is of particular interest to view the matter from the angle of what employers have done to increase the efficiency and usefulness of employees and what labor unions have done or have not done. Labor unions have spent much money in propaganda simply with the idea of getting more members. Employers have done a great deal to make their employees better workmen, furnishing them better equipment, better surroundings, opportunities for enjoyment in leisure hours, health protection and insurance.

The things that employers have done have made better workmen, have produced greater efficiency and the country as a whole has a net benefit from this increase in efficiency. While they do not contribute, the members of labor unions themselves participate in the fruits of increased efficiency, the goods they buy costing them less than would otherwise be the case.

Interference in Welfare Systems

WHILE the movement in the United States toward unemployment insurance, old age pensions and kindred benefits to industrial workers, under government direction, has not reached a point where the threat of practical legislation exists, it has grown in popularity among social reformers and in some States they are more insistent in their propaganda. At the same time the American Federation of Labor is actively supporting the inclusion of all forms of welfare benefits in contracts between unions and industrial owners, placing the onus of financial support wholly on employers. One of the great subsidiaries of the Federation has actually worked out such a plan, which is to be put forward from now on in all new contracts.

Probably the wholesale paternalism which in recent years the British Government has fastened upon industry, with its doles and its contributions toward old age, health and unemployment insurance, is exerting an influence in the United States. Such has been the experience where radical innovations have been undertaken by Parliament. Fortunately the Federal constitution stands between industry and nation-wide application of these forms of unnatural control. State constitutions, too, offer obstacles. Then also American labor would not accept easily the British principle of compulsion.

Old age pensions are common enough in this country, but they are given voluntarily by owners, who usually bear the entire expense. The purpose is to reward employees in their old age for long and faithful service, by assuring them an income honorably earned. Relatively few such systems include money contributions by employees. Group insurance, likewise, is generally paid for by the owners. Mutual benefit associations, supported by the workers themselves, look after them in case of sickness or other disability. Unemployment insurance has made only sporadic beginnings. But the Federal and State Governments compel nothing, excepting for Government employees, unless we place workmen's compensation in this category.

The attitude of the British Government in recent years, in guarding the welfare of industrial workers, was illustrated by Winston Churchill, Chancellor of the Exchequer, addressing Parliament outlining and recommending legislation for a new system of old age pensions, when he said: "Any scheme to be of use must be contributory; and any scheme which must be contributory must be compulsory, and above all must cover the whole area of the wage-earning population, which is represented broadly by the fifteen millions of people at present insured. Those fifteen millions, with their dependents, represent thirty millions of people, which is 70 per cent of the entire population. The question is, what burden of additional taxation can be borne in existing circumstances by employers and employed?"

The Chancellor then goes on to relate that "the present capital value of the additional liability to be undertaken by the state under the scheme, apart from the contributions of employer and employee, has been computed at nearly £750,-

000,000," which is something like \$3,630,000,000. The annual cost to the Government alone would be \$125,000,000 in the first year, \$180,000,000 in 10 years, \$200,000,000 in 20 years, always increasing.

Thus the industrialist would be compelled to pay a large percentage of these vast sums in the form of taxes, in addition to compulsory direct contributions. Already British industry carries an enormous burden of unemployment and health insurance, besides tax rates so high as to make even the American income taxes seem small.

Mr. Churchill insists that a successful pension act must be compulsory as to contributions from both employers and employees. The American Federation of Labor also insists that such welfare systems be compulsory, but on the employer only, never on the employee. A bulletin issued by the Federation sets forth:

The problems raised by company insurance, old age pensions, sick and accident benefits, group insurance and other welfare schemes conceived by employers who desire to minimize demands of their employees for better wages and working conditions, or to prevent them from organizing, are in a fair way of being solved. After a year's investigation the general executive board of the Amalgamated Association of Street and Electric Railway Employees has adopted a plan through which all these welfare benefits are to be made part of the contracts entered into by local street car men's unions in the future. And furthermore, the cost must be borne by the industry, no assessments upon the employees being permitted.

The criticism aimed at employers in the above is not deserved. In fact, it is a fresh reminder that militant labor heads resent employer cultivation of good will. Very few private systems of the sort referred to involve any contributions from the workers. Such systems as require that employees pay a share toward the fund which protects them are solidly based on good business. A case where injustice has been done would be difficult to call to mind. As to American old age pensions, nothing in industry is actuated by a better motive.

Our Machine Tools in England

WILLIAM M. PARK, Assistant Trade Commissioner, stationed at London, writing for *Commerce Reports*, points out that American machine tools continue to forge ahead in Great Britain in competition with British machinery, even though, as is well known, the price of tools made in the United States is necessarily higher. Greater accuracy is a chief reason for this preference, according to Mr. Park, though, of course, in many cases this factor is no more important than that of greater productive capacity. Mr. Park says in part:

Practically all dealers in American machine tools in the British market stress the point that the American tools, in nine cases out of ten, are demonstrably more accurate than those of any other nationality. Dealers use this argument as one of their chief "talking points" in promoting sales, and have found it justified so often as to be by now an almost universally accepted fact. For this reason, American machine tools and parts, of even old-established and practically standardized lines, sell well in Great Britain in competition

with well-known domestic makes. American machine tools for such specialized work as automobiles, railroad shop and locomotive equipment, electrical goods, and agricultural implements and machinery, are regarded in the British market as the most advanced of any nationality. Distributors handling the American lines state that they create interest and make sales chiefly through their ability to demonstrate the efficiency of the American products; their saving in labor and their extreme accuracy. Efforts in this respect are greatly assisted through the fact that large quantities of such equipment were imported into Great Britain from the United States during the war, and British producers in engineering trades became familiar with modern American machine tool equipment and what it could accomplish in an efficient way, even under the stress of mass production.

The information is not new in its substance, but at this time, when the machine tool builders of the United States are giving more and more attention to marketing their product abroad, there is encouragement in the statement from one on the ground that there is reason to expect increasing demand outside of this country. What is true in comparing the standing of American and British-built machinery as competitors is equally true in considering the machine shops of other foreign countries. American builders have gone ahead consistently in improving their models and in evolving new types, and have kept a long jump ahead of their competitors abroad.

Wheeling Steel Dividend Payments Incorrectly Reported

Through an error in transmission, a really favorable showing by the Wheeling Steel Corporation for the quarter and the nine months ended Sept. 30, was made to appear unfavorable as published last week. Amounts reported as deferred dividends on the two classes of preferred stock were the amounts disbursed during the nine months. While the company has not paid the full dividends on its A and B preferred stocks both being cumulative, the preferred A at 8 per cent and the preferred B at 10 per cent annually, the deferred payments have been only 1.2 per cent on the former and 1½ per cent on the latter. Full dividend payment for the nine months on the preferred A stock would have called for a disbursement of \$294,701 and as actual disbursements for that period were \$237,620, the amount of the deferred dividend on that stock was only \$57,081. Payment of full dividends at the rate of 10 per cent annually on the preferred stock would have entailed the payment of \$1,691,977. As \$1,353,582 was disbursed, the amount deferred was \$338,395, making a total for both classes of stock of \$395,476. That, of course, is quite different from \$1,591,202 as erroneously reported.

Full dividend requirements for the first nine months of this year would have called for a total of \$1,987,678 on the two classes of preferred stock. The surplus account of the company as of Sept. 30, was \$1,129,271 larger than on Jan. 1. Adding the gain in the surplus to the actual dividend disbursements, it will be seen that the full dividends were earned by a good margin and that the management, if it had chosen to do so, could have paid the full dividends and yet carried \$732,795 to the surplus.

For the full year of 1924, the company's net profits before dividend deductions were only \$865,110. In the first nine months of this year, the company had net profits more than treble those of all of 1924, and this in the face of the fact that it made heavy provision for depreciation.

Improved Inquiry for Finished Steel

British Sheets and Tin Plate Still Active—Belgian and German Wire-Rod Makers Come to "Gentlemen's Agreement"

(By Cablegram)

LONDON, ENGLAND, Nov. 2.

DOMESTIC demand for foundry pig iron is moderate but export sales are poor. Hematite is active and output has increased. The Linthorpe-Dinsdale Smelting Co., Ltd., Middlesbrough, is starting up after 18 months of idleness. Gjers, Mills & Co., Ltd., are relighting one furnace.

Foreign ore is dull, Bilbao Rubio being held at 19s. 6d. to 20s. (\$4.72 to \$4.84) c. i. f. Tees.

There is improved inquiry for finished steel, in both domestic and export markets, but little business is passing and prices are sagging.

Negotiations concerning the proposed international rail trust are reported postponed indefinitely.

Sheets and Tin Plate

Tin plate is firm on recent buying up to June shipment but demand now is quieter on the fluctuating tin market. Makers generally are well sold.

Galvanized sheets are firm on maintenance of the export demand from India, South America and Australia. Makers are quoting higher prices for forward shipments.

Black sheets are moderately active on Far Eastern specifications. Other markets are inclined to purchase small lines.

On the Continent of Europe

Continental prices virtually are ruled by movements of French franc rates, making sterling quotations generally easier. Domestic users are displaying increased interest and fair parcels of semi-finished steel have been sold. Sheet bars have been done at

£4 11s (\$22.02); billets have been sold at £4 8s. (\$21.30); merchant bars at £5 5s. (1.13c. per lb.) and joists (beams) at £5 (1.08c.) all f.o.b.

Belgian and German wire rod manufacturers agreed not to sell in each other's territory and the minimum price now has been raised to £5 16s. (\$28.07) f.o.b.

GERMANY MORE ACTIVE

Large Track and Pipe Orders—To Grant Credits to Russian Tool Buyers

(By Radiogram)

BERLIN, GERMANY, Nov. 2.—Iron and steel markets are more active. Foreign demand is increasing, especially for tubes. The Pig Iron Syndicate will retain its prices, with selling conditions unchanged, throughout November. The Raw Steel Syndicate announces that it will retain through November the present 35 per cent reduction in output.

The German Railroads Corporation has ordered 500,000 tons of track material from the Stahlwerks-Verband. August Thyssen & Co. have received a 40,000,000-mark (\$9,528,000) order for water pipe for South Africa. Thirty-two German manufacturers have arranged to forward machine tools to Russia for consignment depots and have agreed to grant 6 months credit to Russian purchasers.

Negotiations for formation of the Western Steel Trust are continuing. It is reported that the quotas of participating corporations have been agreed upon.

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.84 per £, as follows:

Durham coke del'd.	£0 19s.		\$4.60
Bilbao Rubio ore†	1 0½		4.96
Cleveland No. 1 fdy.	3 9½		16.82
Cleveland No. 3 fdy.	3 6½		16.09
Cleveland No. 4 fdy.	3 5½		15.85
Cleveland No. 4 forge	3 4½		15.61
Cleveland basic	3 5		15.73
East Coast mixed	3 14½		18.03
East Coast hematite	4 19		23.96
Ferromanganese	15 10		75.02
*Ferromanganese	15 5		73.81
Rails, 60 lb. and up.	8 0	to £8 15s.	38.72 to \$42.35
Billets	6 5	to 7 10	30.25 to 36.30
Sheet and tin plate bars, Welsh	6 5		30.25
Tin plates, base box.	0 19¾	to 1 0¼	4.78 to 4.90
			C. per Lb.
Ship plates	7 10	to 8 0	1.62 to 1.73
Boiler plates	11 10	to 12 0	2.48 to 2.59
Tees	7 15	to 8 5	1.67 to 1.78
Channels	7 0	to 7 10	1.51 to 1.62
Beams	6 15	to 7 5	1.46 to 1.57
Round bars, ¾ to 3 in.	8 5	to 8 15	1.78 to 1.89
Steel hoops	10 15	and 12 10*	2.32 and 2.70*
Black sheets, 24 gage	11 5		2.43
Black sheets, Japanese specification†	15 5		3.30
Galv. sheets, 24 gage	16 10, upward		3.57, upward
Cold rolled steel strip, 20 gage	18 0		3.89

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

Foundry pig iron:(a)					
Belgium	£3 0s.	to £3 2s.	\$14.52	to \$15.00	
France	3 0	to 3 2	14.52	to 15.00	
Luxemburg	3 0	to 3 2	14.52	to 15.00	
Basic pig iron:(a)					
Belgium	3 0	to 3 2	14.52	to 15.00	
France	3 0	to 3 2	14.52	to 15.00	
Luxemburg	3 0	to 3 2	14.52	to 15.00	
Coke	0 18		4.36		
Billets:					
Belgium	4 8	to 4 10	21.30	to 21.78	
France	4 8	to 4 10	21.30	to 21.78	
Merchant bars:					C. per Lb.
Belgium	5 5	to 5 6	1.13	to 1.14	
Luxemburg	5 5	to 5 6	1.13	to 1.14	
France	5 5	to 5 6	1.13	to 1.14	
Joists (beams):					
Belgium	5 0	to 5 2	1.08	to 1.10	
Luxemburg	5 0	to 5 2	1.08	to 1.10	
France	5 0	to 5 2	1.08	to 1.10	
Angles:					
Belgium	5 2		1.10		
¼-in. plates:					
Belgium	6 7½	to 6 12½	1.36	to 1.43	
Germany	6 7½	to 6 12½	1.33	to 1.43	
¾-in. ship plates:					
Belgium	6 0	to 6 3	1.30	to 1.33	
Luxemburg	6 0	to 6 3	1.30	to 1.33	
Sheets, heavy:					
Belgium	6 14	to 6 15	1.45	to 1.46	
Germany	6 14	to 6 15	1.45	to 1.46	

(a) Nominal.

Large Gain in October Iron Output

Daily Rate Increases 6655 Tons or 7.3 Per Cent—Six More Furnaces in Blast

WITH many of the reporting companies estimating their production for Oct. 31, data collected largely by wire show a sharp gain in pig iron output in October over September. The daily rate last month was 6655 tons higher than in September or an increase of 7.3 per cent. In September the increase over August was 3632 tons or 4.2 per cent.

The production of coke pig iron for the 31 days in October was 3,023,370 gross tons or 97,528 tons per day as compared with 2,726,198 tons or 90,873 tons per day for the 30 days in September. This is the first time the total has exceeded 3,000,000 tons since last April. A year ago the October production was 2,477,127 tons.

There was a net gain of six furnaces in October, 13 having been blown in and seven blown out or banked. The number active on Nov. 1, therefore, is 206 having an estimated daily capacity of 97,950 tons. This compares with an estimated capacity of 94,550 tons per day for the 200 furnaces active on Oct. 1. Of the 13 furnaces blown in, five were Steel Corporation stacks and five were independent steel company furnaces with three of them merchant furnaces. There were three Steel Corporation furnaces, three independent steel company stacks and one merchant furnace shut down.

Ferromanganese production in October was 21,421 tons compared with 18,381 tons in September. The October spiegeleisen output was 5071 tons against 5162 tons in September.

Among the furnaces blown in during October were the following: One Carrie, one Clairton and one Isabella of the Carnegie Steel Co. in the Pittsburgh district; one Shenango furnace in the Shenango Valley; K furnace of the Cambria steel plant of the Bethlehem Steel Corporation in western Pennsylvania; C furnace

of the Sparrows Point plant of the Bethlehem Steel Corporation in Maryland; one Central furnace of the American Steel & Wire Co. in northern Ohio; the Iron-ton furnace of the Marting Iron & Steel Co. in southern Ohio; one Calumet and one Iroquois furnace in the Chicago district; one furnace of the Colorado Fuel & Iron Co. in Colorado; one furnace of the Tennessee Coal, Iron & Railroad Co. in Alabama; and the Johnson City furnace of the Cranberry Iron Co. in Tennessee.

Among the furnaces blown out or banked during October were the following: One Monongahela furnace of the National Tube Co. in the Pittsburgh district; B furnace at the Sparrows Point plant of the Bethlehem Steel Corporation in Maryland; B furnace of the Youngstown Sheet & Tube Co. in the Mahoning Valley; one River furnace in northern Ohio; two South Chicago furnaces of the Illinois Steel Co. in the Chicago district and the Tuscaloosa furnace in Alabama.

The Sloss-Sheffield Steel & Iron Co. will blow in Gadsden furnace Nov. 10, and Sheffield furnace Dec. 1, and will begin improvements on City furnaces. The company has started up 200 beehive coke ovens.

Production of Steel Companies for Own Use—Gross Tons

Production of Steel Companies for Own Use - Gross Tons						
Total Pig Iron			Spiegeleisen and Ferromanganese*			
	1924	1925	1924	1925	1924	1925
			Fe-Mn	Spiegel	Fe-Mn	Spiegel
Jan. . . .	2,274,005	2,692,537	20,735	7,948	23,578	5,418
Feb. . . .	2,410,658	2,539,785	22,405	9,870	18,184	4,910
Mar. . . .	2,674,565	2,812,995	22,351	13,796	20,062	5,449
Apr. . . .	2,463,027	2,514,828	23,580	4,240	21,448	5,341
May	1,927,461	2,306,887	14,993	9,336	22,679	5,294
June	1,507,110	2,113,566	20,049	9,405	19,836	4,972
½ year.	13,256,826	14,980,598	124,113	54,595	125,787	31,384
July	1,343,952	2,037,160	14,367	15,328	16,614	5,074
Aug. . . .	1,413,314	2,124,439	10,718	8,010	18,867	4,939
Sept. . . .	1,509,360	2,109,205	13,263	5,033	18,381	5,162
Oct. . . .	1,858,502	2,370,382	7,780	10,047	21,421	5,071
Nov. . . .	1,896,886	.....	13,448	8,835	.....	.....
Dec. . . .	2,377,141	.....	21,220	5,284	.....	.....
Year.	23,656,981	.....	204,909	107,132	.....	.....

*Includes output of merchant furnaces.

Production of Coke and Anthracite Pig Iron in United States by Months, Beginning Jan. 1, 1923—Gross Tons

	1923	1924	1925
Jan.	3,229,604	3,018,890	3,370,336
Feb.	2,994,187	3,074,757	3,214,143
Mar.	3,523,868	3,466,086	3,564,247
Apr.	3,549,736	3,233,428	3,258,958
May	3,867,694	2,615,110	2,930,807
June	3,676,445	2,026,221	2,673,457
½ year	20,841,534	17,434,492	19,011,948
July	3,678,334	1,784,899	2,664,024
Aug.	3,449,493	1,887,145	2,704,476
Sept.	3,125,512	2,053,264	2,726,198
Oct.	3,149,158	2,477,127	3,023,370
Nov.	2,894,295	2,509,673	.....
Dec.	2,920,982	2,961,702	.....
Year*	40,059,308	31,108,302	.....

*These totals do not include charcoal pig iron. The 1924 production of this iron was 212,710 tons.

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1921—Gross Tons

	1921	1922	1923	1924	1925
Jan.	77,945	53,063	104,181	97,384	108,720
Feb.	69,187	58,214	106,935	106,026	114,791
Mar.	51,468	65,675	113,673	111,809	114,975
Apr.	39,768	69,070	118,324	107,781	108,632
May	39,394	74,409	124,764	84,358	94,542
June	35,494	78,701	122,548	67,841	89,115
½ year....	52,089	66,578	115,147	95,794	105,039
July	27,889	77,592	118,656	67,577	85,936
Aug.	30,780	58,586	111,274	60,875	87,241
Sept.	32,850	67,791	104,184	68,442	90,873
Oct.	40,215	85,092	101,586	79,907	97,528
Nov.	47,183	94,990	96,476	83,656	.....
Dec.	53,196	99,577	94,225	95,539	.....
Year	45,325	73,645	109,713	85,075	.....

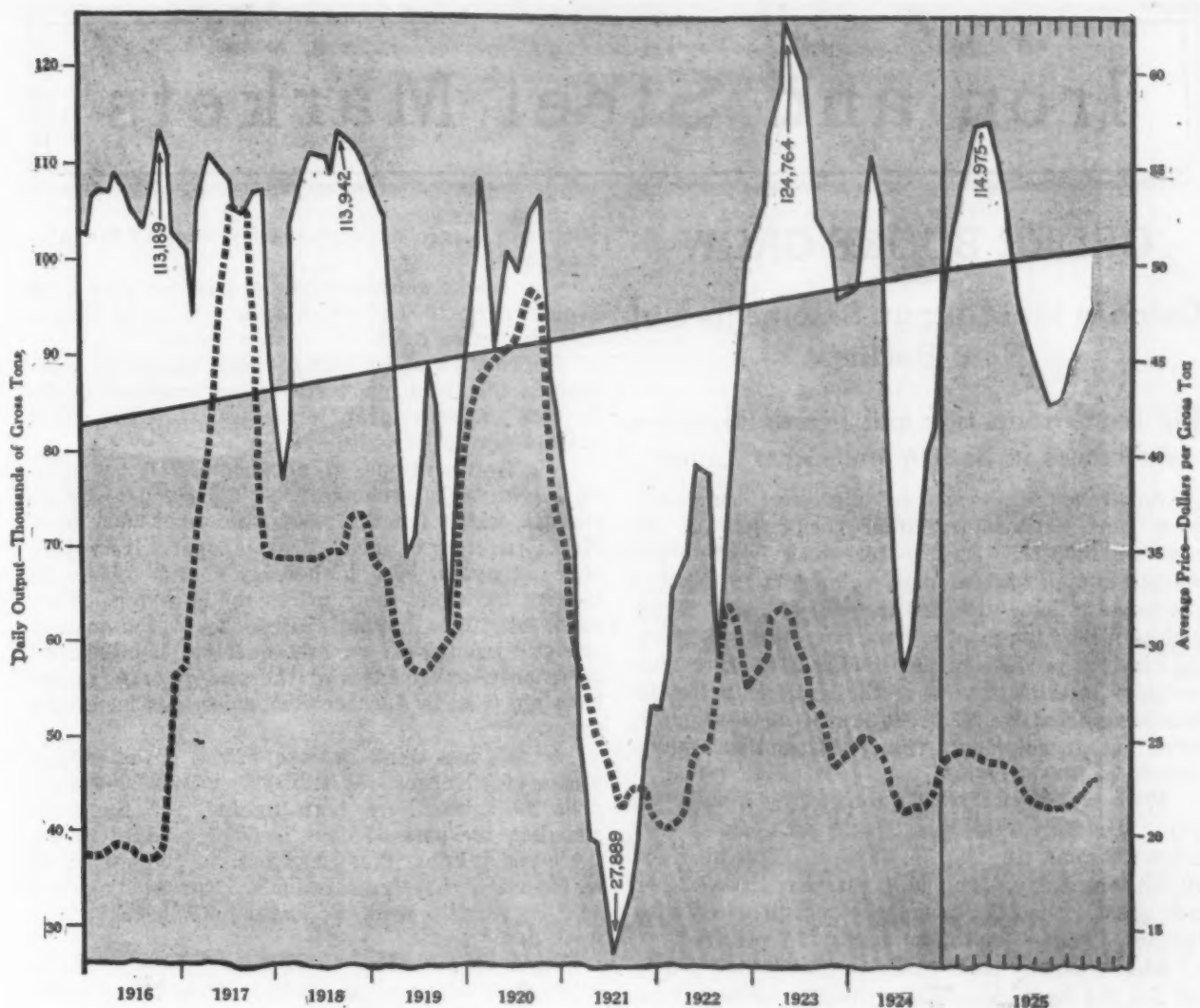
Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant*	Total
October, 1924	59,952	19,955	79,907
November	63,230	20,426	83,656
December	76,682	18,857	95,539
January, 1925	86,856	21,864	108,720
February	90,707	24,084	114,791
March	90,741	24,234	114,975
April	83,827	24,805	108,632
May	74,415	20,127	94,542
June	70,452	18,663	89,115
July	65,715	20,221	85,936
August	68,530	18,711	87,241
September	70,300	20,573	90,873
October	76,464	21,064	97,528

*Includes pig iron made for the market by steel companies.

Pig Iron Production by Districts, Gross Tons

	Oct. (31 days)	Sept. (30 days)	Aug. (31 days)	July (31 days)
New York.....	176,437	148,787	145,631	148,443
New Jersey .....	.....	.....	.....	.....
Lehigh Valley	87,433	77,590	78,174	68,861
Schuylkill Valley	67,077	69,129	70,662	63,803
Lower Susquehanna and Lebanon Valleys	39,157	29,339	28,986	33,046
Pittsburgh district..	633,685	552,496	513,656	471,285
Shenango Valley....	120,705	91,009	90,112	90,171
Western Pa.	102,214	87,217	76,587	78,999
Maryland, Virginia and Kentucky....	97,656	79,194	76,474	71,287
Wheeling district....	128,103	125,199	116,728	110,029
Mahoning Valley....	294,613	269,439	277,788	285,278
Central and Northern Ohio.....	335,147	319,374	339,622	311,563
Southern Ohio.....	39,864	32,350	32,841	45,043
Illinois and Indiana	548,400	607,219	508,022	520,666
Mich., Minn., Mo., Wis., Colo. and Utah	128,804	117,230	119,891	137,871
Alabama	216,550	215,597	228,642	224,837
Tennessee	7,525	5,029	5,710	4,842
Total	3,023,370	2,726,198	2,704,476	2,664,024



Daily Output in October About 7.3 Per Cent More Than in September; Prices Again Higher
Inclined line represents the gradually increasing theoretical needs of the country, and thus shows production in recent months less than the so-called normal. Dotted line represents the average price in dollars per gross ton of No. 2 Southern at Cincinnati, No. 2 at Chicago and No. 2X at Philadelphia

FOUNDRY EXECUTIVES

Cooperation Between Industry and Agriculture to Be Theme of Annual Meeting

A conference of agricultural, industrial and transportation executives will feature the sessions on Wednesday, Nov. 18, of the annual meeting of the National Founders Association at the Hotel Astor, New York. The conference is a part of the comprehensive program of the new movement, "Better Understanding Between Industry and Agriculture," with which the National Founders Association, the National Metal Trades Association, the National Grange and the American Farm Bureau Federation are affiliated. The specific purpose of the conference will be to discuss practical methods of promoting economy in State and local administrative expenditures and the reduction of taxes.

The addresses scheduled for the conference are as follows:

"Why This Conference," by William H. Barr, president National Founders Association.

"Who Pays the Taxes," by James A. Emery, counsel, National Founders Association.

"Taxes, The Great American Crop," by William J. Thompson, former chairman of the executive committee National Grange, South China, Me.

"Taxation as a Family Burden," by Allan Robinson, president Commonwealth Bond Corporation, 50 East Forty-second Street, New York.

"How Taxes Affect Railroad Costs," by R. H. Ashton, president, American Railway Association, Washington.

"Tax Control Through State and Local Group Action," by C. A. Dyer, president Lower Taxes—Less Legislation League, legislative agent, Ohio State Farm Bureau Federation and Ohio State Grange.

The reports of officers and committees and two special addresses are to be presented at the Thursday morning session, Nov. 19. The addresses are: "The Need for Improved Foundry Methods to Overcome Foundry Labor Shortage," by H. M. Lane, president H. M. Lane Co., Detroit, and "Industry and the Public Schools," by L. A. Hartley, director of education, National Founders Association. The administrative council of the association will meet on Tuesday morning and the association will hold a dinner as usual on Wednesday evening. J. M. Taylor, 29 South LaSalle Street, Chicago, is secretary of the association.

Engineering Council to Analyze Giant Power Report

The administrative board of the American Engineering Council, meeting at Columbus, Ohio, Oct. 29 and 30, authorized the appointment of a committee to review and analyze the Giant Power Report issued by Governor Pinchot of Pennsylvania. The board's action followed representations that the Giant Power Report contains economic fallacies likely to mislead the public. The aim of the analysis is to provide a popular interpretation of the report from an engineering standpoint.

Iron and Steel Markets

ORDER BOOKS GROW

Gains in Mill Output, Shipments and New Business

Pig Iron Production and Prices Higher—Advances in Sheets and Other Lines

As November opens leading steel companies have more satisfactory order books than in the past six months. Buying for stock is of larger volume and in several lines shipments in October are found to have exceeded those of January, which had been the high month of the year in that respect.

Pig iron production for October is of more than ordinary interest in view of the triple gain for the month reported by all producers of steel—namely, in output, in shipments from mills and in unfilled orders for finished steel.

With a total of 3,023,370 tons of pig iron for 31 days, the daily rate was 97,528 tons, as against 2,726,198 tons for the 30 days of September, or 90,873 tons a day. The daily rate was thus 7.3 per cent greater than in September; in comparison with October of last year the gain was 13.7 per cent.

Steel company blast furnaces contributed nearly all the pig iron increase last month, or 6164 tons a day, the increase of merchant furnaces being only 491 tons a day.

Thirteen furnaces blew in last month and seven blew out. The 206 furnaces active on Nov. 1 had an estimated daily capacity of 97,950 tons a day, against 94,550 tons a day for the 200 furnaces in blast one month previous.

Ingot output is gaining along with that of pig iron, Youngstown companies leading for this week. The Chicago district is at 82 per cent of capacity, which is close to the average for the country.

Progress has been made in the efforts of the mills to stabilize prices. Independent sheet mills, after accumulating a backlog, have announced advances of \$2 a ton on black and blue annealed sheets, and as high as \$4 on galvanized. The leading sheet interest, after October bookings that were the largest in 21 months, has made similar advances.

Cold rolled bars, after weeks of irregularity, are held at a \$2 advance by a number of makers.

In the advancing tendency, more apparent in the week, semi-finished steel has shared. Sheet bars in the Pittsburgh district have sold at \$35, after a considerable fourth quarter tonnage had been taken at \$33.50.

The effort to establish a 2c. basis for steel bars for first quarter delivery has been furthered by larger inquiry, that price having been quoted to forge shops and other makers of automobile parts. In general, the firmer attitude of rolling mills in various lines followed the closing of considerable business at early October prices for delivery over two or three months.

In the distribution of 1926 rail business, the past week has added 280,000 tons, of which 125,000 tons

went to Chicago mills and 80,000 tons to the Alabama mill.

Car works announce new orders for over 4100 freight cars, 4000 of which were for the St. Louis-San Francisco road.

Fabricating shops took so much low-priced business in the third quarter that the lengthening deliveries on structural work are stiffening that market perceptibly.

Pig iron continues to advance and it has been an active week, particularly at Cleveland and Cincinnati, which together had sales of 75,000 tons. Northern iron in most markets apart from Chicago is again 50c. higher, and some Alabama makers have put their prices up \$1 a ton. Furnace companies buying their coke in the market are still holding off on first quarter business, and there are further cases of the sale of coke, rather than pig iron, by furnace companies that have coke ovens.

A halt has come in coke prices, after several weeks of advances. Within two weeks 2000 Connellsville ovens have been lighted and the total added in the past 60 days is 6000. Added to the increased output, there has been a congestion of shipments at Eastern terminals. Furnace coke has sold at \$8 this week as against \$8.50 to \$9 one week ago.

Pig iron, according to THE IRON AGE composite price, has advanced to \$20.79, from \$20.38 last week. It is now \$1.58 above the figure of one year ago. The gain for the present rise has reached \$1.83 per ton.

Finished steel has advanced also, THE IRON AGE composite price being 2.424c. per lb. against 2.410c. last week. Today's figure is the highest since mid-August, but is 1½ per cent below that of one year ago.

Pittsburgh

Order Books Unusually Full and Prices Show Marked Strength

PITTSBURGH, Nov. 2.—The belief has become so widespread among consumers of steel that prices have seen their lowest for the present that it is no longer necessary to urge specifying. Adding to purchases for stock there are those for early consumption, coming particularly from the automobile and agricultural implement industries. To say nothing of railroad and structural steel requirements, the mills have the most satisfactory order book situation they have had in a year.

Prices are growing stronger. Where advances have been made the prime consideration has been to establish for future business prices that insure a fair profit. It will be in the first quarter of next year, rather than in the present quarter, that real benefits of higher prices will accrue to the mills.

Sheet prices have advanced \$2 to \$4 a ton since a week ago. The larger advance was in galvanized sheets, the price of which reflects the higher cost of zinc and the fact that makers are well supplied with business. These advances were announced by almost all of the independent companies last week and were

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 2, 1925	Oct. 27, 1925	Oct. 6, 1925	Nov. 4, 1924
	1925	1925	1925	1924
No. 2X, Philadelphia...	\$23.26	\$23.26	\$22.26	\$21.76
No. 2, Valley furnace...	20.00	19.50	19.00	19.00
No. 2, Southern, Cin'ti...	25.05	24.05	23.05	21.55
No. 2, Birmingham, Ala.†	21.00	20.00	19.00	17.50
No. 2 foundry, Ch'go furn.*	22.00	22.00	21.50	20.50
Basic, del'd, eastern Pa...	22.00	22.00	21.00	20.00
Basic, Valley furnace...	19.50	19.00	18.50	18.50
Valley Bessemer del'd P'gh	22.26	21.76	21.26	21.26
Malleable, Chicago furn.*	22.00	22.00	21.50	20.50
Malleable, Valley	20.00	19.50	19.00	19.50
Gray forge, Pittsburgh...	21.26	20.76	20.26	20.26
L. S. charcoal, Chicago...	29.04	29.04	29.04	29.04
Ferromanganese, furnace...	115.00	115.00	115.00	95.00

Rails, Billets, etc., Per Gross Ton:	Nov. 2, 1925	Oct. 27, 1925	Oct. 6, 1925	Nov. 4, 1924
	1925	1925	1925	1924
O.-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	35.00	33.50	35.00	35.50
O.-h. billets, Pittsburgh...	35.00	33.50	35.00	35.50
O.-h. sheet bars, P'gh...	35.00	33.50	35.00	37.00
Forging billets, base, P'gh	40.00	40.00	40.00	40.50
O.-h. billets, Phila...	39.30	39.30	40.30	41.17
Wire rods, Pittsburgh...	45.00	45.00	45.00	45.00

Cents	Nov. 2, 1925	Oct. 27, 1925	Oct. 6, 1925	Nov. 4, 1924
	1925	1925	1925	1924
Skelp, gr. steel, P'gh, lb...	1.90	1.90	1.90	1.90
Light rails at mill...	1.65	1.65	1.65	1.80

Finished Iron and Steel, Per Lb. to Large Buyers:	Nov. 2, 1925	Oct. 27, 1925	Oct. 6, 1925	Nov. 4, 1924
	1925	1925	1925	1924
Iron bars, Philadelphia...	2.12	2.12	2.12	2.32
Iron bars, Chicago...	1.90	1.90	1.90	2.10
Steel bars, Pittsburgh...	2.00	2.00	2.00	2.00
Steel bars, Chicago...	2.10	2.10	2.10	2.00
Steel bars, New York...	2.34	2.34	2.34	2.34
Tank plates, Pittsburgh...	1.80	1.80	1.80	1.80
Tank plates, Chicago...	2.10	2.10	2.10	2.10
Tank plates, New York...	1.94	1.94	2.04	1.94
Beams, Pittsburgh	1.90	1.90	1.90	1.90
Beams, Chicago	2.10	2.10	2.10	2.10
Beams, New York	2.24	2.24	2.24	2.14
Steel hoops, Pittsburgh...	2.50	2.50	2.40	2.50

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 2, 1925	Oct. 27, 1925	Oct. 6, 1925	Nov. 4, 1924
	1925	1925	1925	1924
Sheets, black, No. 28, P'gh	3.25	3.15	3.10	3.50
Sheets, black, No. 28, Chi-	3.25	3.25	3.30	3.60
cago dist. mill...	4.50	4.30	4.20	4.60
Sheets, galv., No. 28, P'gh	4.60	4.40	4.35	4.70
Sheets, galv., No. 28, Chi-	4.60	4.40	4.35	4.70
cago dist. mill...	2.40	2.30	2.25	2.70
Sheets, blue, 9 & 10, P'gh	2.50	2.40	2.40	2.80
Sheets, blue, 9 & 10, Chi-	2.50	2.40	2.40	2.80
cago dist. mill...	2.65	2.65	2.60	2.75
Wire nails, Pittsburgh...	2.70	2.70	2.70	2.85
Wire nails, Chicago dist.	2.50	2.50	2.50	2.50
mill	2.55	2.55	2.55	2.60
Barbed wire, galv., P'gh...	3.35	3.35	3.35	3.45
Barbed wire, galv., Chi-	3.40	3.40	3.40	3.55
cago dist. mill...	\$5.50	\$5.50	\$5.50	\$5.50
Tin plate, 100 lb. box, P'gh				

Old Material, Per Gross Ton:	Nov. 2, 1925	Oct. 27, 1925	Oct. 6, 1925	Nov. 4, 1924
	1925	1925	1925	1924
Carwheels, Chicago	\$18.00	\$18.00	\$17.00	\$18.00
Carwheels, Philadelphia...	18.50	18.50	18.50	17.50
Heavy steel scrap, P'gh...	19.50	19.00	18.00	19.00
Heavy steel scrap, Phila...	17.00	17.00	16.50	17.00
Heavy steel scrap, Ch'go...	16.00	16.00	16.00	16.50
No. 1 cast, Pittsburgh...	18.00	18.00	17.00	18.00
No. 1 cast, Philadelphia...	18.00	18.00	18.00	17.50
No. 1 cast, Ch'go (net ton)	18.00	18.00	17.50	17.50
No. 1 RR. wrot, Phila...	18.50	18.50	18.00	18.00
No. 1 RR. wrot, Ch'go (net)	15.50	15.00	14.00	15.00

Coke, Connellsville, Per Net Ton at Oven:	Nov. 2, 1925	Oct. 27, 1925	Oct. 6, 1925	Nov. 4, 1924
	1925	1925	1925	1924
Furnace coke, prompt...	\$8.00	\$8.50	\$3.50	\$3.00
Foundry coke, prompt...	9.00	8.50	4.25	4.00

Metals, Per Lb. to Large Buyers:	Nov. 2, 1925	Oct. 27, 1925	Oct. 6, 1925	Nov. 4, 1924
	1925	1925	1925	1924
Lake copper, New York...	14.75	14.75	14.50	13.50
Electrolytic copper, refinery	14.50	14.50	14.12 1/2	13.37 1/2
Zinc, St. Louis...	8.67 1/2	8.60	8.05	6.55
Zinc, New York...	9.02 1/2	8.95	8.40	6.90
Lead, St. Louis...	9.50	9.25	9.25	8.87 1/2
Lead, New York...	9.85	9.60	9.60	8.90
Tin (Straits), New York...		63.25	60.62 1/2	53.50
Antimony (Asiatic), N. Y.	20.00	19.00	17.25	12.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

THE IRON AGE Composite Prices

Nov. 2, 1925, Finished Steel, 2.424c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

One week ago,	2.410c.
One month ago,	2.403c.
One year ago,	2.460c.
10-year pre-war average,	1.689c.

Nov. 2, 1925, Pig Iron, \$20.79 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

One week ago,	\$20.38
One month ago,	19.71
One year ago,	19.21
10-year pre-war average,	15.72

High			Low		
1923	1924	1925	1925	1924	1923
2.824c., April 24	2.789c., Jan. 15	2.560c., Jan. 6	Finished Steel 2.396c., Aug. 18	2.460c., Oct. 14	2.446c., Jan. 2
\$30.86, March 20	\$22.88, Feb. 26	\$22.50, Jan. 13	Pig Iron \$18.96, July 7	\$19.21, Nov. 3	\$20.77, Nov. 20

named by the American Sheet & Tin Plate Co. as of Nov. 2. Cold finished steel bars have been advanced \$2 a ton, following heavy specifications against contracts. That makers are commonly not anxious for additional tonnage is shown by an advance of \$1.50 a ton in prices of billets, slabs and sheet bars. We note one sale of 1000 tons of sheet bars at \$35, Pittsburgh.

A further advance of 50c. a ton has been established in pig iron and heavy melting steel scrap also is up 50c. a ton since a week ago, small sales being made at as high as \$20. The coke situation has grown slightly easier in the week, but this development seems to have its explanation in warmer weather and a natural falling away in the demand for coke to replace hard

coal. Run of 48-hr. coke in the past few days has been readily obtainable at \$8 per net ton at oven as against \$8.50 to \$9 a week ago.

Not much change is observed in steel works operations, but the tendency plainly is upward and with finishing mill operations rising, it looks as though additional ingot making capacity must soon come into use. The sheet industry has made a notable forward movement in operations and with independent companies getting early 1926 tin plate business, there is a heavier operation of that branch of the industry. October sheet business of the American Sheet & Tin Plate Co. was the largest of any one month in 21 months. There has been a noticeable quickening in demand for wire prod-

ucts, and as has been the case for some time, there is very heavy engagement of bar and strip mills. Pipe mill operations are slowing up somewhat, but at this time of the year that is the usual condition due to lighter demands from the oil industry.

Pig Iron.—A further advance of 50c. a ton has been established in all grades since a week ago. There is a good deal of anxiety on the part of melters to be protected against possible further advances that seem likely unless there is an early adjustment of the anthracite deadlock with its attendant effect upon coke prices. But the real basis for strength is found in the fact that many producers already are well sold against their yard stocks and probable production over the remainder of the year, and they show little concern over additional business. There is not the usual distinction between prices for prompt and first quarter tonnages, as considerable iron that will be made in the next 60 days may not be shipped until after Jan. 1. The Sharon Steel Hoop Co., which recently inquired for 5000 tons of basic iron, is understood to have secured that tonnage at \$18.50, Valley furnace, but the market since has moved up to \$19.50, at which several fair-sized lots were sold and none now seems to be available at less. There was one sale of 2000 tons of Bessemer at \$20.50, Valley furnace and another lot of 500 tons at the same price. Sales of foundry iron have been quite numerous. We note one sale of 1500 tons of Nos. 1, 2 and 3 grades at \$20, Valley furnace for the base grade. Other sales ranging from a carload to 500 tons and reaching a respectable total also have been made at \$20, Valley furnace for No. 2 and even \$20.50 has been done on iron moving west from the Valley; this business is possible because of high prices at Lake front furnaces. The market also is stronger on low phosphorus iron, which is now held at \$27.50 as the minimum. W. P. Snyder & Co. make the October average price of basic iron from Valley furnaces \$18.609 as against \$18.28 in September and of Bessemer \$19.74 against \$19.27 for the month before. THE IRON AGE October averages were \$18.65 for basic and \$19.625 for Bessemer.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$19.50
Bessemer	20.50
Gray forge	\$19.50 to 20.00
No. 2 foundry	20.00 to 20.50
No. 3 foundry	19.50 to 20.00
Malleable	20.00 to 20.50
Low phosphorus, copper free....	27.50

Ferroalloys.—There is continued activity in spiegel-eisen and the principal commercial producer now has such a heavy order book for tonnages for shipment over the remainder of this year and the first half of next year as to be rather cautious about additional business, especially in view of the possibility of a high coke market during the first quarter of 1926. The single carload price remains at \$34, furnace, for 19 to 21 per cent material, but is very firm at that figure. Purchases of ferromanganese continue to run in small lots for early shipment, with consumers evincing little interest in their early 1926 requirements, but prices hold firm at recent levels. Some increase in the cost of producing domestic ferromanganese is forecast by the high level of coke prices, but unless there is an advance in the imported material, it is rather difficult to see how domestic producers can raise their prices. It might be added that abroad there is no coke price problem. It is early for producers of 50 per cent ferrosilicon to start covering customers against next year's requirements. Current demands for this material do not amount to much, but specifications on contracts are coming in without much prodding. Prices are given on page 1291.

Wire Products.—The past week seems to have brought a realization among jobbers that prices are not going to be any lower in the near future, and there has been a material quickening in the demand for all products distributed by them. Specifications for nails have been good and barbed wire and fence are showing gains as compared with recent weeks. Plain wire is still the most active commodity. Makers of coated nails seem to have reached the conclusion that they were

needlessly giving away their profits and they now are disposed to hold to a minimum quotation of \$1.85, base, per count keg, Pittsburgh, after having gone as low as \$1.70 to get some desirable business. There is talk of higher prices on galvanized nails, wire and barbed wire, because of the strength of the zinc market. That metal now is commanding 9c. per lb. at local mills, as against about 6½c., delivered, during the summer. Prices are given on page 1290.

Tubular Goods.—Conditions do not change much. While there is a well sustained demand for standard pipe and a fair number of small lot line pipe orders, demand for oil well pipe is tapering, as it usually does at this time of the year. The mills do not have very heavy obligations and prompt deliveries are being made on all kinds and sizes of pipe. Mill operations remain at 75 to 80 per cent of capacity, but some capacity is engaged on mill stocks, which got rather low in the early fall. Some fair-sized orders for seamless tubes are being booked, but competition for business in boiler tubes generally is so sharp that prices are easy. Discounts are given on page 1290.

Sheets.—Prices are beginning to get back to profitable levels. The past week has seen practically all independent makers move to 3.25c., base Pittsburgh, for black, 2.40c., base, for blue annealed and 4.50c., base, for galvanized, and the advances, which amount to \$2 to \$4 a ton from last week's levels, have been followed by the American Sheet & Tin Plate Co., which announced them as effective Nov. 2. The biggest advance has been in galvanized sheets, which have been affected not only by a good demand, but by the strength of the zinc market. Many sheet makers have almost as much business as they can take care of during the remainder of the year and one maker in this district reports no available productive capacity over the next 60 days. Buyers, notably jobbers, seem to have concluded prices are not going to be lower and there has been a flood of specifications, which mean some building up of stocks in second hands. October was the largest month since the early part of 1924 in orders and specifications for the American Sheet & Tin Plate Co., which last week operated 80 per cent of its sheet mills, against 68 per cent at the end of September, and this week is scheduled for an 85 per cent operation. Sheet making capacity as a whole is probably 85 per cent engaged this week and there is enough business in sight to maintain that rate to the end of the year. There has been no change in automobile sheets, but there is a genuinely good demand for them and a further advance is likely in the first quarter price, which will be announced soon. Prices are given on page 1290.

Tin Plate.—The American Can Co. has not yet placed its tin plate orders for the first half of next year. When the business is placed, it will call for more than 5,000,000 boxes, the total mentioned in recent reports. If anything, tin plate business is better than it has been, as the independent companies seem to have "sold" the idea of early specifications and winter production to their customers, a plan that the American Sheet & Tin Plate Co. has followed successfully in recent years. Pig tin prices do not weaken much and tin plate prices are very firm. First quarter and first half of 1926 tin plate prices will probably be announced in the next fortnight.

Hot-Rolled Flats.—Makers are well supplied with business and specifications are coming along with a freedom that makes it imperative to put on more mill capacity so that deliveries be made as promptly as desired. Not much of the tonnage now leaving the mill carries present prices, but new business, of which there is a fair volume considering that makers were rather generous about protecting their customers before the advance, is all at the full quotations. Prices are given on page 1290.

Cold-Rolled Strips.—Makers are indifferent about adding to already large obligations except at the advanced price of 3.90c., base, Pittsburgh, which was announced about ten days ago. Specifications against old orders, particularly from the automobile parts makers, are heavy.

Bolts, Nuts and Rivets.—The recent advance in rivet prices has found full adoption and on new busi-

ness the market is firm at \$2.60, base, per 100 lb., Pittsburgh. All makers have adopted the advance in cap and set screws and new and higher prices have just been announced on semi-finished hexagon and castelated and slotted nuts. There is a very firm situation in bolts and the idea that prices are more likely to go up than down is helping specifications on contracts. Prices and discounts are given on page 1291.

Cold Finished Steel Bars.—Effective Nov. 2, leading makers have advanced prices \$2 a ton to a base of 2.50c., f. o. b. Pittsburgh district mills, and the local company which has a plant at Gary has also announced a Chicago district mill base of 2.50c. This price is to apply only on such business as may be placed over the remainder of this year. There has been considerable dissatisfaction with the recent ordinary tonnage base of 2.40c., Pittsburgh, which was the result of sharp competition and made it hard for some producers to get back a new dollar for an old one. There has been no complaint about the volume of business for several weeks.

Steel and Iron Bars.—The steel bar market here is very firm at 2c., base, Pittsburgh. Makers are well supplied with business, especially on screw stock quality bars, and specifications are coming in freely. Early deliveries on the popular sizes of this grade are not now being promised by any of the makers. Ordinary merchant bars still can be had fairly promptly, but not so promptly as was true a few weeks ago. Iron bar prices also are holding, with the demand steadily expanding. Prices are given on page 1290.

Structural Steel.—The market has a stronger tone, but only on small tonnages and for quick delivery can the mills get 2c., base, Pittsburgh. On attractive business the ruling figure still is 1.90c. Prices are given on page 1290.

Plates.—Although mills are trying hard to establish a minimum of 1.90c., Pittsburgh, there is still sufficient open capacity and enough competition for orders, particularly outside of this district, to check the movement. The situation is improving, however, because more railroad business is coming into sight. About 4000 tons of steel, chiefly plates, will be required for 30 coal barges which are likely to be closed in the next few days. Prices are given on page 1290.

Semi-Finished Steel.—The market has strengthened again. Youngstown mills, having taken all the business they wanted at \$33.50, have since a week ago advanced to \$35, Youngstown, and this week Pittsburgh mills have followed suit. We note one sale of 1000 tons of sheet bars at \$35, Pittsburgh, shipment to be made by a Cleveland maker. Otherwise new business does not amount to much, but specifications against contracts are heavy, due to a fuller engagement of finishing capacity. Strength in pig iron and scrap also is a factor in the higher price idea of makers. Wire rod sales are somewhat heavier than they were recently. Open market activity in skelp is limited. Forging quality steel is reported to be selling well and it is claimed that \$40 base, Pittsburgh, is not being shaded. Prices are given on page 1291.

Rails and Track Accessories.—No new standard rail orders have come to the local maker in the week, but that interest now is pretty well supplied with business and the Pennsylvania railroad is yet to be heard from. There is not much activity in track accessories in which local makers can participate outside of the 3,000,000 tie plates which will be distributed this week by the Baltimore & Ohio Railroad. The Central of Georgia is in the market for 7000 kegs of spikes, the Atlantic Coast Line for 15,000 kegs and the Chesapeake & Ohio for 2100 kegs. Large spikes are holding well at \$2.80 base, per 100 lb., Pittsburgh, but small ones are easy at \$3 and sales are noted at \$2.90. Light rails are moving, but not with much snap. Prices are given on page 1290.

Coke and Coal.—The advance in coke prices has halted. In the past 60 days no less than 6000 ovens have been lighted in the Connellsville district, almost one third of which have gone into production in the past two weeks. There is not only the factor of a rapid

increase in output, but also the fact that there has been a considerable congestion of shipments at Eastern terminals which, with a less active demand on account of warmer weather, has made maintenance of recent demand and prices impossible. The past few days run of oven furnace coke has been quite plentiful in relation to demand and \$8 per net ton at ovens is about all the market would stand. This compares with \$8.50 and \$9 a week ago. The price of foundry coke, however, still is very firm and for selected 72-hr. coke, \$9 appears to be as low as any can be had. The demand for foundry coke is not especially heavy but producers appear unwilling to take business except at much higher prices than they are getting for run of oven 48-hr. coke. There is a good market for the domestic sizes of coal, with sales of egg size noted as high as \$4.25 per net ton at mines. Coal for industrial use is finding a good sale, but prices do not advance much as supplies are quite ample.

Old Material.—Strength in the blast furnace grades of scrap is the interesting development of the past week. Short shoveling turnings and mixed borings and turnings have been sold at \$16, and the market still is pointed upward, as the high cost of coke makes the use of these grades necessary in keeping down costs. Steel companies are the principal buyers, since foundry iron known to contain scrap is not readily salable in this district. Machine shop turnings and cast iron borings, for the first time in several months, now are at a discount from the prices on short turnings and mixed borings and turnings. The scrap market is generally strong and with dealers paying as much to cover short sales of heavy melting steel as they secured, it is evident that they are expecting still higher levels. Two companies in the district have been drawing heavily against their scrap piles lately and are expected to be buyers before long.

A maker of railroad steel specialties has paid \$20 per ton for a small quantity of heavy melting steel, and offerings of this grade at less than \$19.50 per ton have disappeared, making the market quotable from \$19.50 to \$20 on that grade. The market also has stiffened on compressed sheets, sales of which are noted at slightly more than \$18.50. Dealers are offering \$18.50 for this grade.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	\$19.50 to \$20.00
No. 1 cast, cupola size	18.00 to 18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	20.00 to 20.50
Compressed sheet steel	18.50 to 18.75
Bundled sheets, sides and ends ..	17.50 to 17.75
Railroad knuckles and couplers ..	21.50 to 22.00
Railroad coil and leaf springs ..	21.50 to 22.00
Low phosphorus blooms and billet ends	24.00 to 24.50
Low phosphorus plates and other material	23.00 to 23.50
Low phosphorus punchings	21.00 to 21.50
Railroad malleable	19.00 to 19.50
Steel car axles	23.50 to 24.00
Cast iron wheels	18.50 to 19.00
Rolled steel wheels	21.50 to 22.00
Machine shop turnings	15.00 to 15.50
Short shoveling turnings	16.00
Sheet bar crops	22.00 to 23.00
Heavy steel axle turnings	16.50 to 17.00
Short mixed borings and turnings ..	16.00
Heavy breakable cast	17.50 to 18.00
Stove plate	14.50 to 15.00
Cast iron borings	15.00 to 15.50
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	19.00 to 19.50

In the Philadelphia market report appearing in THE IRON AGE of Oct. 15 it was stated that the Reading Co. had bought 3500 tons of bars abroad. We are informed that this statement is incorrect. A purchase of 3500 tons of German steel bars for concrete reinforcing was made by a contracting company which was the successful bidder on the construction of a Reading Co. grain elevator.

Chicago

Record Pig Iron Shipments—Sheets, Cold Rolled Bars and Strip Advance

CHICAGO, Nov. 3.—Ingot output of the leading producer in the Chicago district is now practically at 82 per cent, having advanced slightly during the last week. This producer has made no change in the number of active blast furnaces, but has materially increased its use of cold metal, which may point to the early blowing in of idle stacks. Operations of the leading independent have also expanded, thereby bringing the general average of ingot production in the district up to the 82 per cent level. Inquiries for structural material are in good volume and with fabricating shops well booked, bids on current projects have stiffened and are probably more satisfactory now than at any time during the year. Over 50,000 tons of plates, shapes and bars will be required in the construction of 4000 cars placed by the St. Louis-San Francisco, 1000 box cars ordered by the Central of Georgia and 200 stock cars bought by the Illinois Central. Specifications from automobile builders have not diminished, and before the close of October farm implement manufacturers had begun to supplement their steel purchases for the fourth quarter. It is now known that local rail producers booked 125,000 tons out of 280,000 tons for which distribution was announced during the week.

Blue annealed, black and galvanized sheets have advanced and quotations on cold rolled strip and screw stock are also higher than the prevailing prices of a week ago.

The pig iron market is strong and October shipments were the largest in the history of the local trade.

Pig Iron.—Spot buying of pig iron is heavy and the market in general is strong. The prices of last week still appear to prevail, although a few sales of Northern iron for immediate delivery have been made at \$22.50, base local furnace. Buyers, in large numbers, have specified beyond their anticipated requirements and now find that deliveries on new purchases are tightening. Shipments are said to exceed production, thus depleting still further the stocks at furnaces. Purchases for first quarter are being made in greater volume in spite of hesitancy upon the part of sellers to open their books for that delivery. It is admitted in the trade that Canadian iron can enter some points in Northern Wisconsin and Michigan in competition with Chicago iron, should the latter go to the \$22.50 basis. Sales of good-sized tonnages of Northern iron are reported in Indiana, Illinois and Michigan, these districts being more active now than Wisconsin. A fair volume of charcoal iron has moved during the week at the ruling market quotation.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$22.00
Northern No. 1 foundry, sil. 2.25 to 2.75	22.50
Malleable, not over 2.25 sil.	22.00
High phosphorus	22.00
Lake Superior charcoal, averaging sil. 1.50 delivered at Chicago	29.04
Southern No. 2 (all rail)	\$26.01 to 27.01
Southern No. 2 (barge and rail)	24.18 to 25.18
Low phos., sil. 1 to 2 per cent copper free	31.20 to 31.60
Silvery, sil. 8 per cent.	33.29
Ferrosilicon, 14 to 16 per cent.	45.25 to 45.75

Plates.—The St. Louis-San Francisco has placed 4000 freight cars, distributed as shown elsewhere. The Missouri Pacific inquiry, which calls for about 3000 cars, is said to be very active and is expected to be closed in the near future. The placing of 1000 box cars by the New York Central is being held up until prices have been received on that railroad's most recent inquiry, which is for 1000 55-ton gondolas. The trade anticipates that the 2000 cars will be placed at one time. Steel makers are keenly interested in recent inquiries for gas holders which will total not less than

10,000 tons. These are for the most part for erection in the States of Massachusetts and Pennsylvania. Steel for oil storage tanks is in active demand and local fabricators estimate that not less than 15,000 tons is before the market. The Marland Refining Co. is inquiring for a large number of tanks for erection at Ponca City, Okla. Automobile demand for light plates and strip is well maintained. Tank plates in this district are firm at 2.10c., Chicago.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Bars.—Makers of soft steel bars are experiencing more and more difficulty in maintaining the delivery schedules which had been fairly well established during the last half of October. Building activity is going forward at an unchanged rate and automobile manufacturers, who were expected to slow down by this time, are still placing liberal specifications. Warehouses are said to be taking on stock and the implement industry has been forced to supplement its fourth quarter requirements which were contracted for during July and August. Soft steel bars remain firm at 2.10c., Chicago. Demands upon rail steel bar makers are insistent and one producer claims to be booked until practically the first of the year. Rail steel bars are steady at 2 to 2.10c., delivered, Chicago. Railroads and industries in general are showing greater interest in bar iron and mills report that sales and specifications during the week are more promising than for some time past. Several orders, in lots of about 400 tons each, were placed during the week at 1.95c., delivered, Chicago switching district.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 1.90c. to 2c., Chicago; rail steel bars, 2c. to 2.10c., Chicago.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

Wire Products.—Wire mills, not being able to meet current demands and also anticipating somewhat the requirements of the spring trade, have again increased operations and are said to be operating between 65 and 70 per cent. The increase in demand appears to be spread over practically all products and is not confined to any particular parts of the country. Mill prices, which are growing firmer, are shown on page 1290.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.05 per 100 lb.; common wire nails, \$3.05 per keg; cement-coated nails, \$2.05 to \$2.20.

Rails and Track Supplies.—The Chesapeake & Ohio is reported to have placed 30,000 tons of rails of which 12,000 went to the Illinois Steel Co., 12,000 to the Inland Steel Co., and 6000 tons to the Bethlehem Steel Co. Local producers are looking forward to the placing of rail contracts by ten major railroads which operate in the Chicago district. Among these is the expected 100,000 tons from the Santa Fe. No announcement of the Missouri Pacific rail distribution has yet been made. The Wabash is said to be inquiring for 15,000 tons and indications are that the Missouri-Kansas-Texas requirements will also total 15,000 tons. The Chicago & Eastern Illinois is asking for prices on 7500 tons and the Kansas City Southern will soon contract for 5000 tons. Track supplies are moving in good volume, the outstanding inquiry being that of the Baltimore & Ohio for 15,000 tons of tie plates.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c. mill; track bolts with square nuts, 3.90c. to 4c., mill; steel tie plates, 2.25c. to 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c., base, and track bolts, 4.55c., base.

Sheets.—With sheet mills operating at a high rate and generally well booked, prices have advanced and are now quoted as follows, base Chicago district mills: Blue annealed, 2.50c.; black, 3.35c., and galvanized, 4.60c. Reports indicate that orders on books will

assure the present rate of operations for at least the remainder of the year and in some instances beyond.

Chicago delivered prices from mill, 3.40c. for No. 28 black, 2.55c. for No. 10 blue annealed and 4.65c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4c. base for black, and 5c. base for galvanized.

Structural Material.—Awards of structural steel during October were large and the volume of new inquiries shows no signs of falling off. Most fabricating shops are booked for the next three months. Although fabricators are not as yet satisfied with the prices which they are obtaining, the level of current bids is said to be the highest of the year. The Everett Pulp & Paper Co., Everett, Wash., has placed 1000 tons with the Minneapolis Steel & Machinery Co., and the American Car & Foundry Co. has taken 750 tons for the United States Engineers' office building at Louisville, Ky. The Budd Wheel Co., Detroit, Mich., is inquiring for 2000 tons for new construction work. Delivery dates on plain material are gradually becoming extended. The price is firm, but unchanged, at 2.10c., Chicago.

The mill quotation on plain material is 2.10c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bolts, Nuts and Rivets.—Contracts for the fourth quarter are now virtually all closed and specifications continue to be issued freely. Structural rivets are now quoted at 2.75c., base Chicago, which is an advance of \$3 a ton over the recent low point. The market is steady and warehouse prices and discounts are unchanged.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to $\frac{3}{4}$ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to $\frac{3}{4}$ x 4 in., 50 off; larger sizes, 50 off; hot-pressed nuts, squares, tapped or blank, \$3.50 off; hot-pressed nuts, hexagons, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

Cast Iron Pipe.—With foundries well booked and demand still persistent the price of 6-in. and larger pipe in the Chicago district is firm at \$42, Birmingham, or \$50.20, delivered, Chicago. Typical schedules of deliveries are as follows: 3, 4, 6 and 8-in., the second week in December; 10-in., the third week in November; 14 and 16-in., Nov. 15; and 20-in. the third week in December. Some business is now being taken for delivery in 1926, but as yet no announcement has been made of winter manufacture and delivery concessions. With commitments until well toward the end of the year, pipe makers agree that this is probably the best year that the industry has ever experienced. Summit, Ill., is inquiring for 175 tons of 6-in. Class B and Lake Forest, Ill., has awarded 250 tons of 6, 8 and 10-in. Class B to Jason L. Frye, general contractor. It is understood that 1100 tons for Clarendon Hills, Ill., will be awarded during the coming week.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$54.20; 6-in. and over, \$50.20; Class A and gas pipe, \$4 extra.

Cold Rolled Strip.—The base price of this commodity has been advanced \$3 a ton to 3.90c. per lb., base Cleveland, or 4.20c. per lb., delivered, Chicago. Demand is heavy and mills are reported to be operating at 100 per cent.

Reinforcing Bars.—The past week has again given indication of a slackening in the rate of reinforcing bar lettings. It is also noticeable that new inquiries are not developing as rapidly as during the first two weeks of October. The bulk of the tonnage now being booked is for numerous jobs ranging from 25 to 75 tons each. There remain, however, a number of good-sized inquiries which, dealers believe, will result in business soon. Contractors for a south inclosure for the Grant Park Stadium, Chicago, have started to excavate for footings. This would indicate that the 1300 tons of reinforcing bars required for the completion of the structure will soon be placed. That a large amount of building is in prospect is indicated by the fact that Chicago architects are unusually busy and have more work on hand than can be conveniently taken care of with the organizations which they have maintained through the late summer and early fall months. The

warehouse price of billet steel reinforcing bars is unchanged at 2.60c., Chicago.

Lettings include:

Cadillac Motor Co., service building, Chicago, 120 tons, to Olney J. Dean & Co.

Power plant, Dixon, Ill., 200 tons, to Olney J. Dean Co.

Hospital, Freeport, Ill., 100 tons, to Concrete Steel Co.

Central Cold Storage Warehouse Co., building, Peoria, Ill., 200 tons, to Hugh J. Baker & Co.

McCormick Estate Mercantile Building, Lake Street and Michigan Avenue, Chicago, 700 tons, to the American System of Reinforcing.

Hotel Hayes, Jackson, Mich., 100 tons for sub-structure, to Truscon Steel Co.

Pending work includes:

Junior High School, North Shore and Bishop Avenue, Chicago, 500 tons, general contract awarded to the Lind Construction Co.

Six-story apartment building, 4826 Sheridan Road, Chicago, 180 tons. General contractors, Realty Building & Construction Co.

Eitel Brothers Hotel, Delaware and Cass Streets, Chicago, 130 tons, general contract awarded to H. J. McLennan Co.

Woodruff Ice & Cold Storage Co., Peoria, Ill., 100 tons, general contract taken by Vredenburg Lumber Co.

Apartment building, 1320 North State Street, Chicago, 600 tons. General contractor, Hegeman-Harris Co.

Freshman dormitory, University of Notre Dame, South Bend, Ind., 100 tons.

Public school building, Seminole and McVicar Streets, Chicago, 160 tons.

Northern State Life Building, Chicago, 100 tons.

Coke.—This commodity is unchanged at \$10.75, delivered in the Chicago switching district. The present rate of oven operations is still protected by coking coal contracts made before the advance in prices at the mines. It is reported, however, that another block of ovens will be fired at South Chicago during the coming week and that coal for their operation will be bought on the open market.

Old Material.—The market is still rather inactive, with sales confined largely to carlots. Dealers hesitate to sell, believing that the market will work to a higher level before the end of this year. Large consumers continue to remain out of the market and reports are persistent to the effect that the steel users are well stocked at least for their current requirements. Some consumers of heavy melting steel are picking up small tonnages at \$16.25 per gross ton, delivered, and dealers are said to be trading for this commodity among themselves at a price of \$16. Railroad offerings are as follows: Pennsylvania, 40,000 tons; Santa Fe, 3600 tons; Wabash, 2600 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

Per Gross Ton	
Iron rails	\$18.50 to \$19.00
Cast iron car wheels	18.00 to 18.50
Relaying rails, 56 lb. to 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	19.75 to 20.25
Railroad tires, charging box size	19.50 to 20.00
Railroad leaf springs, cut apart	19.75 to 20.25
Rails for rolling	19.25 to 19.75
Steel rails, less than 3 ft.	19.50 to 20.00
Heavy melting steel	16.00 to 16.50
Frogs, switches and guards, cut apart	18.25 to 18.75
Shoveling steel	15.75 to 16.00
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheets	14.25 to 14.75
Axle turnings	14.50 to 15.00
Steel angle bars	19.25 to 19.75
Steel knuckles and couplers	18.75 to 19.25
Coil springs	20.00 to 20.50
Low phos. punchings	18.00 to 18.50
Machine shop turnings	10.00 to 10.50
Cast borings	12.75 to 13.25
Short shoveling turnings	12.75 to 13.25
Railroad malleable	19.00 to 19.50
Agricultural malleable	18.00 to 18.50
Per Net Ton	
Iron angle and splice bars	18.25 to 18.75
Iron arch bars and transoms	21.00 to 21.50
Iron car axles	26.50 to 27.00
Steel car axles	18.00 to 18.50
No. 1 busheling	12.00 to 13.50
No. 2 busheling	9.50 to 10.00
Pipes and flues	11.00 to 11.50
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	14.25 to 14.50
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	17.00 to 17.50
No. 1 agricultural cast	16.75 to 17.25
Locomotive tires, smooth	16.50 to 17.00
Stove plate	15.00 to 15.50
Grate bars	15.00 to 15.50
Brake shoes	14.25 to 14.75

San Francisco

Speculation as to Price Tendencies Absorbs Attention of Buyers

SAN FRANCISCO, Oct. 31 (*By Air Mail*).—Interest in the price situation and improvement in the number of inquiries have been the outstanding features of the week. Some of the independent producers have advanced galvanized sheets \$3 to \$4 a ton, making the range now being quoted 4.30c. to 4.50c., base, Pittsburgh. In plates, 2.20c., c.i.f. Coast ports, is again reported to have been done. Most of the Eastern mill representatives, however, refuse to go below 2.25c. A rumor has been circulated that less than 2.30c., c.i.f., is still possible in shapes, but it lacks confirmation. The recent advances in Eastern pig iron quotations have influenced the local market to the extent of making price tendencies firmer, but no definite advance, in either Utah or foreign iron, has yet been made.

In regard to the Mokelumne River pipe line project, \$5,000,000 worth of bonds are now being offered for sale, and water rights hearings have been concluded at Sacramento, although no permits have yet been issued. In this connection Dr. George C. Pardee, president of the East Bay Municipal Utility District, says that "the results of the hearings have been quite satisfactory to the East Bay Municipal Utility District, and I am quite sure that we will get our permits from both the State Division of Water Rights and the Federal Power Commission."

Pig Iron.—The Southern Pacific Co. has placed 1000 tons of 2.75 to 3.25 per cent silicon foundry iron with a local broker. Aside from this, little of consequence has been closed. The leading domestic interest is now taking orders for first quarter delivery, but it is understood that comparatively few buyers have entered the market as yet. Prices show firmer tendencies, but no specific advances have yet been made.

*Utah basic	\$27.00 to \$28.00
*Utah foundry, sil. 1.75 to 2.25....	27.00 to 28.00
**English foundry	26.00
**Belgian foundry	24.50 to 25.00
**Dutch foundry	24.00
**Indian foundry	24.00 to 25.00
**German foundry	25.00

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Shapes.—Structural lettings known to have been closed during the week total about 900 tons and fresh inquiries call for 7600 tons. The McClintic-Marshall Co. took 750 tons for a theater in Hollywood, and the Judson Mfg. Co. was awarded 150 tons for a factory building in Oakland. The 454 tons for the Everett Pulp & Paper Co., Everett, Wash., was all taken by the Minneapolis Steel & Machinery Co. instead of being split between the Minneapolis concern and the Wallace Equipment Co., as previously reported. Bids are expected to be called in the near future for 7000 tons for a city hall in Los Angeles. While rumors of less than 2.30c., c.i.f. Coast ports, were circulated during the past week, they lack authenticity. Eastern mills continue to quote 2.30c. to 2.35c., c.i.f. Coast ports.

Plates.—It is reported that 2.20c., c.i.f. Coast ports, has again been named by an Eastern mill, but verification of this is lacking. Most of the Eastern mills continue to quote 2.25c. to 2.30c., c.i.f. Coast ports. No awards of 100 tons or more are known to have been made during the week, but several new inquiries have come up for figures. Bend, Ore., will close bids Nov. 20 for about 850 tons for a pipe line, the East Bay Water Co., Oakland, Cal., has closed bids on 375 tons; the Southern California Edison Co., Los Angeles, is expected to be in the market in the near future for about 3000 tons; Auburn, Wash., will close bids Nov. 14 for 300 tons; a barge for the Santa Fe Railroad calls for 700 tons; two ferry boats for the Key System Transit Co., Oakland, will require 1600 to 3000 tons of plates and shapes, and a number of other smaller jobs are pending or expected to come up for figures within a short time.

Bars.—While there is an effort on the part of local reinforcing bar jobbers to stabilize prices, nothing definite has been done, as yet, which could be construed to mean that price shading has run its course. Jobbers' prices are still more or less nominal at 2.75c. to 3.35c. base, per lb. for carload lots. Most of the jobs placed during the week call for less than 100 tons. Only two are known to have been placed calling for over 100 tons, namely, 115 tons for a bridge and culvert in Oakland, taken by Gunn, Carle & Co., and 400 tons for the Goodyear Rubber Co. plant in Los Angeles, which was placed with an unnamed Los Angeles jobber. A hotel in Honolulu, H. I., is expected to require about 200 tons, and an office building, also in Honolulu, will call for 500 tons.

Sheets.—Some of the independent producers have advanced their quotations on galvanized sheets \$3 to \$4 a ton, making the present Pittsburgh base prices 4.30c. to 4.50c. One of the local mills has refused to accept additional orders for galvanized sheets until further notice, as it has booked all of the business that it can conveniently handle for the time being. Blue annealed sheets are quoted at 2.25c. to 2.30c., base Pittsburgh, and black sheets range from 3.10c. to 3.20c. base Pittsburgh.

Rails and Track Supplies.—The Southern Pacific Co. will close bids Nov. 6 for 1,500,000 tie plates, 3760 kegs of track bolts and 29,000 kegs of track spikes. The United States Steel Products Co. is understood to have taken 1200 tons of 116-lb. girder rails placed a week ago by the Los Angeles Railroad Co.

Warehouse Business.—While some jobbers report a marked improvement in sales over last year, others complain that general business is more or less spotty in character. Prices are unchanged, but firmer tendencies are noted.

Merchant bars, \$3.30 base, per 100 lb.; merchant bars, $\frac{3}{4}$ in. and under, rounds, squares and flats, \$3.80 base, per 100 lb.; soft steel bands, \$4.15 base, per 100 lb.; angles, $\frac{3}{4}$ in. and larger x $1\frac{1}{2}$ in. to $2\frac{1}{2}$ in., inc., \$3.30 base, per 100 lb.; channels and tees, $\frac{3}{4}$ in. to $2\frac{1}{2}$ in., inc., \$3.90 base, per 100 lb.; angles, beams and channels, 3 in. and larger, \$3.30 base, per 100 lb.; tees, 3 in. and larger, \$3.30 base, per 100 lb.; universal mill plates, $\frac{1}{4}$ in. and heavier, stock lengths, \$3.30 base, per 100 lb.; spring steel, $\frac{1}{4}$ in. and thicker, \$6.30 base, per 100 lb.; wire nails, \$3.50 base, per 100 lb.; cement coated nails, \$3 base, per 100 lb.; No. 10 blue annealed sheets, \$3.85 per 100 lb.; No. 28 galvanized sheets, \$5.90 per 100 lb.; No. 28 black sheets, \$4.80 per 100 lb.

Steel Pipe.—The Republic Supply Co. is low bidder on 489 tons of black pipe required by the city of San Francisco for the Hetch-Hetchy water supply system. The Honolulu Oil Co. inquiry for 1000 tons of black pipe is still pending. The city of Los Angeles is expected to award 163 tons of galvanized pipe within the next week or ten days. The Pacific Pipe & Supply Co. has been awarded about 160 tons of galvanized pipe by the city of San Bernardino. Inquiries are more numerous, but they are mostly for small lots.

Cast Iron Pipe.—The city of San Bernardino has awarded 206 tons of 4- and 6-in. Class C to the United States Cast Iron Pipe & Foundry Co. Eureka, Cal., will close bids Nov. 3 on 107 tons of 8-in. B; Redwood City, Cal., will close bids Nov. 2 on about 105 tons, and Paso Robles, Cal., will close bids on the same date for about 190 tons of 6, 10 and 20-in. B. While quotations generally are unchanged at \$50, base water shipment, San Francisco, a recent letting is understood to have been taken at about \$40. One of the Eastern producers is now quoting \$52.50 to \$53.50, water shipment, San Francisco, and some interests expect higher price levels in view of the recent advances in pig iron in the Eastern markets.

Coke.—Trading is confined to small lots, although some of the local importers say that greater interest is being shown. While prices are firmer, no changes have been made in local importers' quotations which are as follows:

English beehive, \$15 to \$16 at incoming dock, and English by-product, \$12 to \$14; German by-product, \$11.50 to \$12.

Boston

Sales of Foreign Pig Iron Gain—Coke and Scrap Advance

BOSTON, Nov. 3.—Buying of pig iron the past week shifted to imported material. A textile machinery maker is credited with buying 1000 to 1500 tons of No. 2X and No. 1X Dutch iron at \$23.50 a ton delivered duty paid, and a Massachusetts stove maker has closed for 600 tons of German No. 2 plain iron at \$21 on dock duty paid. These prices are somewhat out of line with those quoted openly on such irons, inasmuch as Dutch foundry is reported as on a basis of about \$24 on dock Boston duty paid, and German \$22.50. Indian iron, which is inactive, is openly quoted at \$23 on dock Boston duty paid. Quotations on domestic iron have not been influenced by the reported price-cutting on foreign material. Buffalo district No. 2 plain iron is generally held at \$21, furnace, No. 2X at \$21.50, and No. 1X at \$22.50, while western Pennsylvania No. 2 plain is \$21, No. 2X \$21.50 and No. 1X \$22, and Virginia and Alabama prices are firmly maintained. The one eastern Pennsylvania furnace with iron available for New England has withdrawn from the market. Sales of all kinds of iron for the past week are estimated at 3000 to 3500 tons. A New Hampshire foundry will close this week on 300 tons each of No. 2 plain and No. 2X for first quarter shipment.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$24.65 to \$25.15
East. Penn., sil. 2.25 to 2.75.....	25.15 to 25.65
Buffalo, sil. 1.75 to 2.25.....	25.91
Buffalo, sil. 2.25 to 2.75.....	26.41
Virginia, sil. 1.75 to 2.25.....	28.92 to 29.42
Virginia, sil. 2.25 to 2.75.....	29.42 to 29.92
Alabama, sil. 1.75 to 2.25.....	29.60
Alabama, sil. 2.25 to 2.75.....	30.10

Shapes and Plates.—The strength of prices in other sections of the country is not reflected in the local market for shapes and plates. What little business was placed during the past week was on a basis of 2.265c. to 2.365c. per lb., delivered, or 1.90c. to 2c., base Pittsburgh, for shapes, and 2.065c. per lb., delivered, or 1.70c., base Pittsburgh, for plates. Bids will be opened this week on 250 tons of steel required for a Brighton, Boston, project, the only round tonnage in the open market today. Two large plant additions to be erected by the Gillette Safety Razor Co., South Boston, will be largely constructed of reinforced concrete.

Coke.—The coke situation remains exceptionally strong. The New England Coal & Coke Co. is quoting by-product foundry coke on contract shipments at \$13 a ton, delivered, where the freight rate does not exceed \$3.10 a ton. It has advanced spot foundry coke \$1 a ton to \$14, delivered, and domestic fuel, wholesale, \$1.50 a ton to \$10, ovens. The company is virtually sold up on domestic coke for the winter. The Providence Gas Co. quotes by-product foundry coke at \$12.50 a ton, delivered, but is confining deliveries as much as possible to within a \$2.53 freight rate zone, and has no foundry or domestic coke except for regular customers. The Troy, N. Y., by-product coke ovens are committed to Jan. 1, with the exception of a small amount for December delivery. Now that other sections of the country are calling on Connellsville district ovens for fuel in large quantities, little is coming into New England. During the past week a Connecticut consumer bought 1000 tons of coke, the largest order accepted by a New England oven. A year ago New England ovens opened their books for first half of 1925 contracts. There is no indication when they will open their books this year for first half business.

Old Material.—Quotations on material suitable for mills in the Pittsburgh district have appreciated under the stimulus of increased buying. Heavy melting steel leads in activity, with the current market \$13 to \$13.50 on cars shipping point, or \$1 a ton higher than a week ago. There was some buying for New England consumption early in the week at \$12, but bids have been raised 50c. Machine shop turnings also have gone up 50c. a ton to \$9.60 to \$10, most business moving at

\$9.60. Mixed borings and turnings, which are in limited supply, are in demand at prices 50c. to 60c. a ton higher than a week ago, while the market for such material as forged scrap and skelton is higher. Cast iron borings, shafting and axles apparently are not wanted and prices remain as heretofore. Machinery cast, stove plate and railroad malleable also remain unchanged, presumably because of a lack of activity.

The following prices are for gross ton lots delivered consuming points:

Textile cast	\$20.00 to \$20.50
No. 1 machinery cast.....	19.50 to 20.00
No. 2 machinery cast.....	15.50 to 16.50
Stove plate	13.50 to 14.25
Railroad malleable	19.00 to 19.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$13.00 to \$13.50
No. 1 railroad wrought.....	12.50 to 13.00
No. 1 yard wrought.....	11.50 to 12.00
Wrought pipe (1 in. in diameter, over 2 ft. long).....	11.50 to 12.00
Machine shop turnings.....	9.60 to 10.00
Cast iron borings, chemical.....	11.50 to 12.00
Cast iron borings, rolling mill.....	9.00 to 9.50
Blast furnace borings and turnings	9.25 to 9.60
Forged scrap	10.00 to 10.25
Bundled skeleton, long.....	10.00 to 10.25
Forged flashings	10.00 to 10.25
Bundled cotton ties, long.....	9.50 to 10.00
Bundled cotton ties, short.....	10.00 to 10.50
Shaftings	18.00 to 18.50
Street car axles.....	18.00 to 18.50
Rails for rerolling.....	14.00 to 14.25
Scrap rails	13.00 to 13.50

Birmingham

Coke Shipped East—Pig Iron Advances—Finished Steel Strong

BIRMINGHAM, Nov. 2.—With steady sales of pig iron in the Birmingham district, quotations are advancing and some scarcity has developed in one or two grades. Plans for increasing production are maturing. The Sloss-Sheffield Steel & Iron Co. will blow in its No. 1 blast furnace at Gadsden within another week or ten days. The Republic Iron & Steel Co. is pushing repairs on a furnace at Thomas and the Tennessee Coal, Iron & Railroad Co. is losing no time in relining a furnace at Ensley. Sales are being made at \$21 per ton for No. 2 foundry for delivery during the first quarter of the coming year, while small lots have brought \$21.50. The Central Iron & Coal Co. will rush repairs on its furnace but it will be December before the stack will be ready to go in. One of the larger companies of this district is now obligated well through the first quarter. Melt in this district and deliveries outside of the territory exceed production considerably and it is now believed that there will be very little iron on furnace yards after Jan. 1. The Sloss-Sheffield Steel & Iron Co. has five furnaces in operation and next week will have a sixth in service. Middle West consumers, stove foundries in particular, have purchased rather liberally from Birmingham furnace interests, asking for early delivery. Considerable iron is being shipped by water and rail into Indiana and Illinois. No iron is being sold under \$21 and indications point to a withdrawal of this price in another fortnight, if not before.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil....	\$21.00
No. 1 foundry, 2.25 to 2.75 sil....	21.50
Basic	20.50
Charcoal, warm blast.....	30.00 to 32.00

Finished Steel.—With some of the finishing mills behind in deliveries, with fabricating plants unable to get prompt transportation service into adjoining States because of embargoes, and with new business coming in almost daily, the steel market in the Birmingham district is strong. Rail and fastening orders for the Ensley plant of the Tennessee Coal, Iron & Railroad Co., and purchases of steel for fabricating and welding shops, together with the requirements of railroad car plants, are steadily building up unfilled tonnage at the mills. Soft steel bars continue to range from 2.15c. to 2.25c., Birmingham.

Cast Iron Pipe.—Pipe shops are operating practically at capacity and their stocks are low. Meanwhile new business continues to develop with more in

sight, promising continued activity for the cast iron pressure pipe industry. In the cast iron soil pipe and fitting trade slight improvement is to be noted, with shipments showing an increase.

Coke.—Demand for coke is felt from many directions and Birmingham prepared coke is being shipped in quantity to the Eastern section of the country as well as to the Northwest and Middle West. Prices have advanced materially, ranging from \$6 to \$6.50 per ton. Inquiries are numerous and production is being increased as much as possible. Beehive ovens are being started up and all by-product ovens are in operation. Considerable business has been received from districts where anthracite has been the common fuel. Chicago interests are making inquiry for coke also. Local demand for coke has also improved.

Old Material.—A large volume of old material is moving in this territory and consumption is heavy. Heavy melting steel remains at \$13, but an advance of \$1 is looked for before the end of the week. Dealers are preparing a large quantity of old material and look for a protracted continuation of present activity. Blast furnaces are using scrap, while the open-hearth furnaces at Fairfield have been steady consumers of heavy melting steel.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel.....	13.00 to 14.00
Railroad wrought.....	12.00 to 13.00
Steel axles.....	18.00 to 20.00
Iron axles.....	17.00 to 19.00
Steel rails.....	13.00 to 14.00
No. 1 cast.....	16.00 to 17.00
Tramcar wheels.....	16.00 to 17.00
Car wheels.....	15.00 to 16.00
Stove plate.....	13.00 to 14.00
Machine shop turnings.....	7.00 to 8.00
Cast iron borings.....	7.00 to 8.00
Rails for rolling.....	16.50 to 17.00

Buffalo

Pig Iron Still Advancing Although Sales Decline—Scrap Strong

BUFFALO, Nov. 2.—The market is quiet but firm. Buying has eased off with the rise in prices, but considerable tonnage is still pending. Exclusive of one large lot, inquiry totals 5000 to 10,000 tons, including 3000 tons of malleable and basic from a New York State melter. The largest inquiry is 32,000 tons of malleable and foundry for the Buick Motor Co., Flint, Mich. Prices range from \$20.50, base, quoted by an interest which is practically sold up, to \$21 for the fourth quarter. On first quarter foundry iron the market ranges from \$21 to \$22. On malleable the ruling quotation is \$21 and on basic \$20.50. One producer has sold 16,000 tons, shipped 17,000 tons so far this month, and has made (up to Oct. 28) 13,000 tons in two furnaces. This interest whose quotation for all deliveries is \$21 base, is asking \$21.50 for No. 2X and \$22.50 for No. 1 foundry iron.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25.....	\$20.50 to \$22.00
No. 2X foundry, sil. 2.25 to 2.75.....	21.00 to 22.00
No. 1 foundry, sil. 2.75 to 3.25.....	21.50 to 22.50
Malleable sil. up to 2.25.....	20.50 to 21.00
Basic.....	20.50
Lake Superior charcoal.....	29.28

Finished Material.—The market is firm for most products with some advances recorded. Black sheets have advanced to 3.25c., base Pittsburgh, and galvanized to 4.50c. Galvanized has been influenced by an increase in the price of spelter. Bars are fairly active with a fair number of carload lot inquiries out. Reinforcing bars have advanced to 2.75c. from stock, with 2.65c. still prevailed at local mills. The Packard automobile agency has let contracts for a new building and salesroom, requiring 200 tons of concrete bars.

Warehouse prices are being quoted as follows: Steel bars, 3.25c.; steel shapes, 3.35c.; steel plates, 3.55c.; No. 10 blue annealed sheets, 3.80c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.45c.; cold rolled shapes, 4.40c.; cold rolled rounds, 3.95c.; wire nails, 4c.; black wire, 4.05c.

Old Material.—A large local mill which does not buy strictly No. 1 heavy melting steel for its open-hearth furnaces, continues to purchase at \$18 and has picked up possibly 5000 tons in the past week or so. Buying of hydraulic compressed and No. 1 busheling at \$1 to \$1.50 under this price continues. Some activity has developed in the sale of steel axles, which are quotable at \$20 to \$21. The market is growing stronger and a good buying movement seems probable within a week or ten days.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel.....	\$18.00 to \$18.50
Low phosphorus.....	20.00 to 20.50
No. 1 railroad wrought.....	16.50 to 17.00
Car wheels.....	16.50 to 17.50
Machine shop turnings.....	12.00 to 12.50
Cast iron borings.....	13.00 to 13.50
No. 1 busheling.....	16.50 to 17.00
Stove plate.....	15.00
Grate bars.....	14.50 to 15.00
Hand bundled sheets.....	13.00 to 13.50
Hydraulic compressed.....	16.50 to 17.50
No. 1 machinery cast.....	16.50 to 17.00
Railroad malleable.....	19.50 to 20.00
No. 1 cast scrap.....	17.00 to 17.50
Iron axles.....	26.00 to 27.00
Steel axles.....	20.00 to 21.00

Cleveland

Sales of 50,000 Tons of Pig Iron—Both Finished and Semi-Finished Steel Stronger

CLEVELAND, Nov. 3.—Prices on steel bars will be established at 2c., Pittsburgh, for the first quarter, according to present indications. Considerable demand for that delivery has developed and on inquiries for several thousand tons from forge shops and other makers of automobile parts 2c. has been quoted. These buyers desired prices as a basis for quoting on specific inquiries from automobile manufacturers. Mills so far have declined to quote on other first quarter inquiries for steel bars. New demand for all forms of finished steel continues heavy. Orders booked in this territory in October showed a good gain over September. Those entered by one large producer exceeded bookings of the previous month by 40 per cent. The plate market shows a firmer tendency, although 1.80c., Pittsburgh, is still the ruling price on round lots. One Cleveland mill has advanced its quotation to 1.90c., and some of the Pittsburgh district mills are making a more determined effort to get this price for small lots. Structural material ranges from 1.90c to 2c., Pittsburgh, the lower being the prevailing price on round tonnages. Screw stock was advanced Monday \$2 a ton to 2.55c., Cleveland.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 3.80c.; No. 28 galvanized sheets, 4.95c.; No. 10 blue annealed sheets, 3c.; cold-rolled rounds and hexagons, 3.80c.; flats and squares, 4.30c.; hoops and bands, 3.85c.; No. 9 annealed wire, \$3 per 100 lb.; No. 9 galvanized wire, \$3.45 per 100 lb.; common wire nails, \$3 base per 100 lb.

Pig Iron.—The market continues very active. Valley prices have become firmly established at \$20, base furnace, for foundry and malleable iron for this year, or an advance of 50c. a ton, and one seller has taken considerable business, mostly in small lots, at \$20.50. For the first quarter a Cleveland producer made a 50c. advance to \$21, at furnace, and later withdrew from the market. With both local makers out of the market the Cleveland price has become virtually established at the Valley price plus the freight rate to Cleveland. A Canton consumer has purchased 5000 tons of basic iron at a reported price of \$19.50, but a later inquiry failed to bring out a quotation below \$20. The Westinghouse Electric & Mfg. Co. has bought 2200 tons of foundry iron for its Cleveland plant for this year's delivery, 700 tons from a local furnace and 1500 tons from a Valley producer, the latter at \$20 base, furnace, with the usual differential for the higher silicon iron. This company is now inquiring for 3500 tons for its Pittsburgh district plant. An Erie foundry has purchased 4000 tons of malleable iron from Buffalo furnaces. The inquiry from the Buick Motor Co. for

21,000 tons of iron for the first quarter is still pending. A Newark, Ohio, stove maker is inquiring for 3000 tons of foundry iron for early shipment. The blowing out of a Cleveland merchant stack has resulted in some inquiry for spot iron in this territory. Sales by Cleveland producers during the week aggregated 50,000 tons, and a large amount of inquiry is pending.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6.01 from Birmingham:

Basic, Valley furnace.....	\$19.50 to \$20.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	21.76
Southern fdy., sil. 1.75 to 2.25....	25.01 to 26.51
Malleable	21.76
Ohio silvery, 8 per cent.....	31.52
Standard low phos., Valley furnace	27.50

Semi-Finished Steel.—Youngstown producers have withdrawn the price of \$33.50, mill, on sheet bars and are now quoting \$35. It is understood that Pittsburgh district mills that recently met the Youngstown price are now holding to the higher quotation. The advance will have little effect, as most consumers are under contract at \$33.50. The leading local producer is holding to \$35, Cleveland and Youngstown, for sheet bars, billets and slabs.

Sheets.—The market is firmer, with most mills now holding to 3.25c. for black, 2.40c. for blue annealed and 4.40c. for galvanized, or \$2 a ton higher than a week ago. Some are asking 4.50c. for galvanized sheets. Automobile body sheets are unchanged at 4.40c. Several Ohio sheet mills are filled up with orders for the remainder of the year. Some consumers are inquiring for round lots for December shipment, evidently with the view of carrying stocks over into January.

Hot-Rolled Strip.—A Cleveland mill on Monday opened its books for the first quarter at the current price of 2.30c., Pittsburgh, for wide material and 2.50c. for narrow strip. While most producers are holding to the recent advance, some buyers claim they are still able to get a quotation of 2.40c. on narrow strip.

Bolts, Nuts and Rivets.—Demand for large bolts has improved considerably as the result of more active buying by railroads. Good orders are also coming from the agricultural implement manufacturers and the demand from the automotive industry continues heavy. Prices are firm. The demand for rivets has picked up considerably as a result of orders from locomotive builders and somewhat better buying by car builders. The leading local maker which advanced its price to \$2.60, Pittsburgh, last week, has restored the 10c. Cleveland differential, making the Cleveland price, \$2.70. It is expected that the new prices will hold, although they have not yet been tested. Small rivets have not been advanced.

Iron Ore.—Shipments of Lake Superior ore during October amounted to 11,004,443 gross tons, as compared with 7,354,873 tons in September and with 5,596,648 tons in October last year. The total movement until Nov 1 was 49,816,469 tons, as compared with 40,558,525 tons during the same period last year.

Coke.—Prices on by-product coke for domestic use have advanced to a point at which they are meeting resistance from buyers and there are indications that the upward movement has been checked. Ohio by-product furnace coke has been sold in considerable quantities the past week at \$10 per net ton. Ohio by-product foundry coke is offered at \$9.50, ovens, for prompt shipment, or 50c. above the November contract price. Connellsville foundry coke ranges from \$9 to \$11, ovens. Most foundries have fair stocks and are not affected by the price flurry.

Reinforcing Bars.—The Patterson Leitch Co. has taken 300 tons for a building at Lee Hall, W. Va., and 175 tons for the Transportation Building, Cleveland. Rail steel bars are unchanged at 1.80c. to 1.90c., mill.

Old Material.—The market is active and prices are 25c. a ton higher on most grades. Two local mills have made additional purchases of heavy melting steel. This grade has not advanced in this market, owing to the fact that a local mill is still holding up shipments be-

cause scrap came in faster than it could be handled. One Cleveland consumer is understood to have bought all the heavy melting steel scrap that it will require through the first quarter. For this grade dealers are paying \$18 to \$18.25, delivered Cleveland, for immediate shipment and \$18.50 for delivery in ten days. The Hudson Motor Car Co. will take bids Nov. 4 for 2500 tons of scrap covering its November production. New railroad lists include the following: Pennsylvania Railroad, 12,000 to 15,000 tons, Nov. 4; Big Four railroad, 4000 tons, Nov. 3; New York Central, 3500 tons, Nov. 4; Michigan Central, blank list, Nov. 4.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$17.25 to \$17.75
Rolls for rolling.....	16.75 to 17.00
Rolls under 3 ft.....	19.50 to 20.00
Low phosphorus melting.....	19.00 to 19.25
Cast iron borings.....	14.50 to 14.75
Machine shop turnings.....	13.00 to 13.25
Mixed borings and short turnings	14.50 to 14.75
Compressed sheet steel.....	15.50 to 16.00
Railroad wrought	14.50 to 15.00
Railroad malleable	20.00 to 20.50
Light bundled sheet stampings...	12.50 to 12.75
Steel axle turnings.....	15.25 to 15.50
No. 1 cast.....	18.00 to 18.50
No. 1 busheling.....	14.50 to 14.75
Drop forge flashings.....	14.75 to 15.00
Railroad grate bars.....	13.75 to 14.00
Stove plate	13.75 to 14.00
Pipes and flues.....	11.50 to 12.00

New York

Heavier Sales of Foreign Pig Iron—Deliveries Extending in Sheets and Shapes

NEW YORK, Nov. 3.—Heavier sales of foreign pig iron have resulted from advances in domestic prices and the reluctance of American producers to add to their forward obligations. Eastern Pennsylvania furnaces, particularly, are unwilling to add materially to their present commitments so long as they are confronted with uncertain coke costs. A few sales are reported at \$22, Eastern Pennsylvania stack, for No. 2 plain, but in some instances furnaces in that district are refusing to quote. Buffalo iron ranges from \$20 to \$21, base furnace, for No. 2 plain, although late reports indicate an advance to a minimum of \$21. Sales in this district during the week are estimated at 20,000 tons. One broker sold 5500 tons, of which a large proportion was foreign iron. The outstanding sale of the week was 6000 tons of No. 2 plain and No. 2X to the Thatcher Co. for first quarter shipment to its Garwood, N. J., and Newark plants. It is understood that the tonnage was divided between Buffalo, eastern Pennsylvania and foreign producers. The Crane Co. has purchased 1000 tons of foreign foundry for its Bridgeport, Conn., plant, and the A. P. Smith Mfg. Co., East Orange, N. J., has closed for 300 tons each of No. 2 plain and No. 2X for first quarter. About 20,000 tons of iron is pending, of which the leading individual inquiry is 5000 tons of foundry for first quarter delivery to the Dundalk, Md., and Lansdale, Pa., plants of the Central Foundry Co. Foreign iron has grown stronger in sympathy with the advances in domestic material. Dutch foundry has advanced to \$24, duty paid port of entry for No. 1X and lower grades, with little tonnage remaining for sale for first quarter. Indian iron has gone up to \$22.50, base, duty paid seaboard, and German foundry is now quoted at \$21 to \$21.50, base, duty paid. Demand has been consistently active ever since the coke situation became menacing, but it would be incorrect to say that there has been a deluge of buying.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.54 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25..	\$24.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	25.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	25.52
Buffalo, sil. 1.75 to 2.25 (all rail) ..	\$24.91 to 25.91
Buffalo, sil. 1.75 to 2.25 (by barge canal del'd alongside in lighterage limits N. Y. and Brooklyn)	22.75 to 23.75
No. 2 Virginia, sil. 1.75 to 2.25..	29.54

Ferroalloys.—While there are very few inquiries for ferromanganese before the market, information is to the effect that several consumers will either make definite inquiries soon or quietly make purchases. The volume of steel output is such that it is felt several companies will enter the market. There have been a few sales of carload and small lots. The spiegeleisen market is only moderately active both as to sales and inquiries.

Warehouse Business.—A large warehouse in this district reports a 20 per cent increase of business in October over September and 30 per cent over August. With the exception of a slight concession occasionally on the larger lots of structural material, all products are strong and the tendency of prices is upward. This is particularly true of galvanized sheets, the rapidly advancing spelter market increasing mill costs and prices, which, it is expected, will be reflected in the warehouse quotations in the next few days when 5.35c. per lb. will probably become the minimum. Consideration of revising prices of bolts downward and screws upward has apparently been dropped as a result of more activity and the belief that change at present would tend to disturb a rapidly improving situation. The market on brass and copper products has been advanced ¼c. per lb. on most items. Prices on page 1304. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Finished Iron and Steel.—Sheet makers to a greater extent than was true last week have sufficient bookings for 1925 delivery to make them slow to consider recently existing price levels, and appearances are that before the end of the week it will not be easy to buy black sheets at 3.15c., Pittsburgh basis, or galvanized sheets at less than 4.50c. Coincidentally with this is the appearance of more orders for rush deliveries and a rather general asking of 2.40c., 3.25c. and 4.50c. for blue, black, and galvanized sheets, respectively for any supplementary business. Buyers are now and then asking for first quarter contracts, with no acceptance of such so far reported. Thus in many quarters the market in general is regarded as less in the hands of the buyer than for a long time. A fair volume of business is reported in wire products, pipe, and steel bars, with some statements also that tin plate is moving in better volume. Structural steel buying, which continues at high pressure, shows increased firmness for a reason similar to that obtaining in sheets. Mills rolling structural material are finding more requests for their steel in other lines, with the result that the stress for utilizing steel capacity is not focussed on the structural department and deliveries are lengthening out. Efforts are being made to stiffen plate prices, and it may be said that a buyer seeking a 1.50c. quotation, Pittsburgh basis, as mentioned last week on 1500 tons has at this writing been unsuccessful.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c.; plates, 1.94c. to 2.14c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.14c. to 2.24c.

Cast Iron Pipe.—Demand continues in good volume and with most makers well booked to the end of the year and a stronger pig iron and coke market, some advance in pipe prices is expected before long. Newark, N. J., has awarded 700 tons of 6 to 16-in. pipe to the Warren Foundry & Pipe Co. The tonnage of pipe, fittings and castings for the Department of Water Supply, Gas and Electricity, New York, bids on which were opened Oct. 19, has been awarded as follows: United States Cast Iron Pipe & Foundry Co., \$85,211; Florence Pipe Foundry & Machine Co., \$146,000; Chapman Valve Mfg. Co., \$18,000; Kennedy Valve Mfg. Co., \$24,000; Flockhart Foundry Co., \$16,000. High discounts are apparently still obtainable in the soil pipe market, but the tendency is toward greater strength.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$50.60 to \$51.60; 4-in. and 5-in., \$55.60 and \$56.60; 3-in., \$65.60 to \$66.60, with \$5 additional for Class A and gas pipe. Discounts of both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 45 to 50 per cent off list; heavy, 55 to 60 per cent off list.

Coke.—With foundries exerting increased pressure for deliveries, either anticipating on contracts or asking for increased tonnage, added to the marked activity in the domestic coke market, prices are still difficult to establish. Foreign coke is not a factor in the situation thus far, as dealers are not inclined to purchase coke that would not be received for a month or more. Scotch and Welch by-product is being offered at \$8.75 per gross ton, c.i.f. and German by-product at \$8 to \$8.25 per ton, c.i.f., all run of the oven. It is estimated by some importers of coke that not to exceed 25,000 tons has been purchased for shipment from Europe or the United Kingdom. Domestic foundry coke is quoted at \$8.50 to \$9.50 per ton, Connellsville. By-product coke has been advanced in this district to \$11.52 per ton, delivered Newark or Jersey City, N. J., an increase of \$1.11 to an oven basis of \$9.50 per ton.

Old Material.—Reflecting the greater strength of prices and increased activity in other markets, scrap is beginning to move upward in eastern Pennsylvania. Thus far actual increases in prices paid by brokers for this delivery have been moderate, but the sentiment of holders of various grades is toward higher prices and scrap is being brought out at lower offers with increasing difficulty. No. 1 heavy melting steel is being purchased today at \$16.25 to \$17 per ton, delivered eastern Pennsylvania consumers. Brokers buying for delivery to a consumer in Phoenixville, Pa., are offering \$14.50 per ton, delivered on machine shop turnings, bundled skeleton and stove plate. The stove plate market again covers a wide range of buying prices, brokers offering \$14.50 per ton delivered Bridgeport, Conn., which takes a \$2 freight rate, \$13.75 per ton, delivered West Mahwah, N. J., and \$14.50 per ton, delivered Harrisburg or Phoenixville, Pa. Borings and turnings are being purchased at \$13.25 per ton, delivered Bethlehem, Pa., an increase in the buying price of 25c. per ton.

Buying prices per gross ton New York follow:

Heavy melting steel (yard).....	\$11.50 to \$12.00
Heavy melting steel (railroad or equivalent)	13.25 to 13.50
Rails for rolling.....	14.25 to 14.75
Relaying rails, nominal.....	23.00 to 24.00
Steel car axles.....	21.50 to 22.00
Iron car axles.....	24.00 to 24.50
No. 1 railroad wrought.....	15.00 to 15.50
Forge fire.....	10.50 to 11.00
No. 1 yard wrought, long.....	14.00 to 14.50
Cast borings (steel mill).....	10.00 to 10.50
Cast borings (chemical).....	13.00 to 14.00
Machine shop turnings.....	10.25 to 11.00
Mixed borings and turnings.....	10.00 to 10.50
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	12.25 to 12.75
Stove plate.....	10.75 to 12.50
Locomotive grate bars.....	11.50 to 12.00
Malleable cast (railroad).....	16.00 to 16.50
Cast iron car wheels.....	14.00 to 14.50
No. 1 heavy breakable cast.....	13.00 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$18.00 to \$18.50
No. 1 heavy cast (columns, building material, etc.), cupola size.....	16.50 to 17.00
No. 2 cast (radiators, cast boilers, etc.)	15.50 to 16.00

Scrap Lettings Bring High Prices at Detroit

DETROIT, Nov. 2.—The large tonnage or waste material sold for November delivery further strengthened the market in that it brought prices equal to the maximums as quoted a week ago. Considerable interest is being shown in first quarter pig iron with furnaces loath to sell for that period in view of the fuel situation. Production schedules in the automobile industry are showing a tendency to taper off, but many plants are figuring on running right through the year without the usual shutdown for inventory.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel.....	\$15.00 to \$15.50
Borings and short turnings.....	11.75 to 12.25
Long turnings.....	10.25 to 10.75
No. 1 machinery cast.....	16.00 to 17.00
Automobile cast.....	23.00 to 24.00
Hydraulic compressed.....	13.50 to 14.00
Stove plate.....	13.50 to 14.50
No. 1 bushing.....	13.00 to 13.50
Sheet clippings.....	9.00 to 9.50
Flashings.....	12.50 to 13.00

Cincinnati

Heaviest Pig Iron Sales of Year—Coke, Scrap and Sheets Advance

CINCINNATI, Nov. 3.—Pig iron sales reached the highest point of the year during the past week, totaling more than 26,000 tons. Most buyers are closing for their first quarter's requirements as rapidly as possible and therefore are making purchases without sending out general inquiries. The furnaces, with little iron to offer for early delivery and with an uncertain fuel situation confronting them, have assumed an independent attitude. Several Southern producers, as well as one Northern furnace, have temporarily withdrawn from the market due to heavy bookings for shipment over the remainder of the year. Sellers in the Ironton district have advanced their price \$1 and are securing \$21, base Ironton, although considerable tonnages were taken during the week at \$20.50. The only active Tennessee furnace has advanced its quotations to \$20, base Birmingham, but practically all of the sales made recently have been on a basis of \$19. Two Alabama furnaces are unable to offer iron for delivery this year and are holding rigidly to \$21, base Birmingham, for first quarter. One producer in that district, however, will take spot business, but is asking \$21. No change has been made in Jackson County silvery prices, although it is reported that one furnace has sold all of its low grades of silvery available for November and December delivery. The largest sale of the week was 3000 tons of Northern foundry iron to an Ohio melter. Other sizable orders included 1000 tons of Northern foundry from a southern Ohio consumer and a similar tonnage of malleable from an Indiana melter. Pittsburgh consumers have contracted for 1200 tons of Southern charcoal iron. Inquiries are out for 7000 to 8000 tons of iron. The Swain Robinson Co., Richmond, Ind., is in the market for 2000 tons of Northern foundry, while a central Ohio melter is asking for 1000 tons. The Marion Machine & Supply Co., Marion, Ind., is inquiring for approximately 1500 tons of foundry iron.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	\$25.05
Alabama fdy., sil. 2.25 to 2.75	25.55
Tennessee fdy., sil. 1.75 to 2.25	24.05
Southern Ohio silvery, 8 per cent	30.77
Southern Ohio fdy., sil. 1.75 to 2.25	23.27
Southern Ohio, malleable	\$22.27 to 23.27

Sheets.—With prices steadily advancing and deliveries gradually lengthening out consumers have been driven to cover their needs for the remainder of the year. The result has been the largest sales of any week since November, 1924. Bookings were well distributed over all varieties of sheets, including specialty grades. Numerous inquiries have been made for sheets for first quarter, but mills are averse to accepting business for that delivery at present prices. Some producers have even gone so far as to refuse to take fourth quarter contracts subject to specifications, preferring instead to confine transactions to actual orders. Galvanized sheets range from 4.30c. to 4.50c., Pittsburgh, but the former quotation will probably be eliminated within the next week. Black sheets are bringing 3.15c. to 3.25c., Pittsburgh, while blue annealed sheets are showing strength at 2.30c. to 2.40c., Pittsburgh. Indiana manufacturers have bought a considerable tonnage of automobile sheets, which are firm at 4.40c., Pittsburgh. Mills in this territory are operating at 85 per cent of capacity.

Bars, Plates and Shapes.—A leading seller reports that sales in October showed an increase of 10 per cent as compared with the previous month. While business has been only moderate in volume, a better tone prevails. Bar specifications and orders are satisfactory and the market is strong at 2c., Pittsburgh. Although producers are trying to establish shapes at 2c., Pittsburgh, they will dip to 1.90c. on sizable lots. Prices of plates range from 1.80c. to 1.90c., Pittsburgh, but

it is becoming increasingly difficult to find a mill which is willing to take orders at the former quotation. Structural steel activity is confined to small jobs.

Wire Goods.—The inflow of orders, especially for fencing and for electrical wire, has been liberal in volume. Unusual interest has been aroused by the purchase by four local jobbers of approximately 600 tons of common wire nails from the Belfont Steel & Wire Co., Ironton, Ohio, at a price of \$2.65 per keg, delivered at the river bank. None of the Eastern mills will quote less than \$2.75, delivered Cincinnati, and several producers are adhering to \$2.65, Pittsburgh, or \$2.94 delivered, thereby refusing to become involved in the sharp competition prevalent in this market. Plain wire is quoted at \$2.54 per 100 lb., delivered Cincinnati, by the independent Ironton mill, but Eastern sellers are holding to prices ranging from \$2.59 to \$2.79, delivered.

Reinforcing Bars.—Sales have receded and no awards of consequence have been made. New billet bars are showing strength at 2c., Cleveland, and rail steel bars are firm at 1.90c., mill.

Warehouse Business.—Several jobbers declare that sales for the past month exceeded those of September by a comfortable margin. Inability of mills to make prompt shipments is forcing consumers who need stock immediately to take their requirements from warehouse dealers. Dullness in structural steel is offset by increased purchases by local machine tool manufacturers. Prices remain unchanged.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4c. to 4.25c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds and hexagons, 3.85c.; squares, 4.35c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c.; No. 28 galvanized sheets, 5.25c.; No. 9 annealed wire \$3 per 100 lb.; common wire nails, \$2.95 per keg base; cement coated nails, \$2.40 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes: prices net per 100 ft. lap welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

Coke.—Shipments of by-product foundry coke in October increased 15 per cent as compared with September, while domestic coke shipments were 30 per cent ahead of those of the previous month. Announcement has been made of an advance in by-product coke, effective Nov. 1. Foundry grades are now selling at \$10.14, delivered Cincinnati, while domestic grades are bringing \$8.14, delivered. It is reported that by-product foundry coke in Michigan is being sold at \$9.50, Detroit ovens, for outside delivery and at \$10, delivered in Detroit. Two nearby companies producing by-product coke have full order books for the rest of the year. One dealer has begun to contract for by-product foundry coke for the first half of next year.

Based on freight rates of \$2.14 from Ashland, Ky., \$3.53 from Connellsville, \$2.90 from New River ovens and \$2.59 from Wise County ovens, we quote f.o.b. Cincinnati: Connellsville foundry, \$12.00 to \$12.53; Wise County foundry, \$8.09 to \$9.09; New River foundry, \$10.40; by-product foundry, \$10.14.

Old Material.—The market has shown considerable improvement during the week. Several mills are again taking shipments on contract and consumers are buying more freely. Prices are strong and most items have advanced 50c. The Big Four is closing today on a list of 4000 tons, of which 1100 tons is heavy melting steel.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	\$14.50 to \$15.00
Scrap rails for melting	14.50 to 15.00
Short rails	18.50 to 19.00
Relaying rails	28.00 to 28.50
Rails for rolling	15.50 to 16.00
Old car wheels	14.00 to 14.50
No. 1 locomotive tires	17.00 to 17.50
Railroad malleable	16.00 to 16.50
Agricultural malleable	15.50 to 16.00
Loose sheet clippings	9.50 to 10.00
Champion bundled sheets	11.50 to 12.00
Per Net Ton	
Cast iron borings	9.00 to 9.50
Machine shop turnings	8.00 to 8.50
No. 1 machinery cast	19.50 to 20.00
No. 1 railroad cast	15.50 to 16.00
Iron axles	23.50 to 24.00
No. 1 railroad wrought	12.00 to 12.50
Pipes and flues	9.50 to 10.00
No. 1 busheling	11.00 to 11.50
Mixed busheling	9.50 to 10.00
Burnt cast	10.00 to 10.50
Stove plate	11.00 to 11.50
Brake shoes	11.00 to 11.50

Philadelphia

Pig Iron Prices Strengthening Due to Coke Situation—Scrap Firmer

PHILADELPHIA, Nov. 2.—The coke situation is held responsible for further advances among some interests ranging from 50c. to \$1 per ton in foundry and basic pig iron. Low phosphorus is up \$2 per ton. Generally furnace interests are hesitant about selling iron into the first quarter, although some sales have been made for that delivery. The prices now point to an asking range of \$22.50 to \$23, furnace, for No. 2 plain foundry. One important interest is selling foundry iron for first quarter shipment based on prices quoted by THE IRON AGE. There still are indications of some furnaces going out of blast unless the fuel situation becomes stable soon. There is but little likelihood, according to sentiment here, of an early settlement of the anthracite strike, and this adds to the apprehension exhibited. The scrap market is firmer, but the only change in prices has related to heavy axle turnings, which have advanced 50 cents.

Pig Iron.—The uncertainty of the coke situation has developed distinct irregularity in the pig iron market. While advanced prices are being asked and obtained, mostly for last quarter delivery, the quotations of various makers differ. The dominating advance, however, seems to range from 50c. to \$1. Some makers of foundry sell for \$22.50 furnace, while others are asking \$23, furnace, for the base grade. Demand for basic iron is comparatively light, but this grade seems likely soon to be on a basis of \$22.50, delivered eastern Pennsylvania. Virginia iron continues to be quoted at the old prices, but indications are that increases in this grade are imminent. So far no Virginia iron has been delivered to this section recently, but shipments from Virginia furnaces to eastern Pennsylvania are anticipated shortly, despite the freight rate of \$5.17 per ton. A sale is noted of 10,000 tons of Virginia iron during the past week for delivery near the furnace, the shipments being for the last quarter and going at \$22.50, furnace. Foreign iron is also stronger and one importer now is asking \$22.50, f.o.b. cars, Philadelphia, for Indian iron. Continental and English iron is quoted at the same prices as Indian iron.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$22.76 to \$23.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	23.26 to 24.13
East. Pa. No. 1X.	23.76 to 24.63
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17
Basic delivery eastern Pa.	22.00 to 23.00
Gray forge	22.00 to 23.00
Malleable	23.00 to 23.50
Standard low phos. (f.o.b. furnace)	24.00
Copper bearing low phos. (f.o.b. furnace)	23.50

Ferroalloys.—No change has developed in the market for ferromanganese. Sales are made in only small lots, with both foreign and domestic tonnages going at \$115, seaboard or furnace.

Billets.—Both rerolling and forging billets show a moderately improved tone, with prices unchanged at \$35 and \$40, base, Pittsburgh, respectively. In sizable lots, however, rerolling billets can be shaded from \$1 to \$1.50.

Plates.—Inquiries for first quarter delivery continue to come in small lots, and the prices asked range from 2c. to 2.10c., base, Pittsburgh. No sales for this delivery are reported. Mills generally are reluctant to commit themselves beyond the last quarter, although some are offering to take limited tonnages for delivery in the new year. The Cramp shipyard has recently contracted for five dump barges, and is estimating on three large boats which would call for a substantial plate tonnage. Shipyards in this section generally are showing more activity, and their building operations during October were larger than for any single month

since the war. Tonnage is pending for 100 locomotives for the New York Central, placed with the American Locomotive Co., 25 locomotives for the same carrier placed with the Lima Locomotive Works and 5 locomotives for the Central of Georgia, placed with the Baldwin Locomotive Works. The general price quoted for plates for early delivery is 1.60c. Pittsburgh, with one maker asking 1.70c.

Structural Steel.—Specifications and sales of structural steel have improved somewhat, although the market continues to lag. Quotations range from 1.80c. to 1.90c., but it is understood that on sizable tonnages the minimum quotations could be shaded.

Bars.—Mills are well booked at 2c., Pittsburgh, although rollings on contract at 1.90c. continue. The market for iron bars is unchanged at 2.12c. to 2.17c., Philadelphia.

Sheets.—One prominent eastern Pennsylvania maker of blue annealed sheets has not as yet formally withdrawn the quotation of 2.30c., Pittsburgh, but is quoting 2.40c. on new business. The advance made in prices by Western mills has given a further stiffening to the market for sheets in this district. Demand is fair for blue annealed, black and galvanized sheets.

Warehouse Business.—Jobbers report business in most lines to be moderately good. Prospects for further improvement are said to be encouraging and stocks are being well maintained. Prices of black and galvanized sheets have been advanced \$1 per ton, the former going to 4.45c. and the latter to 5.55c.

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 2.80c. to 3c.; tank steel plates, ¾ in., 3c.; blue annealed steel sheets, No. 10 gage, 3.35c.; black sheets, No. 28 gage, 4.45c.; galvanized sheets, No. 28 gage, 5.55c.; square, twisted and deformed steel bars, 3c.; structural shapes, 2.75c. to 2.90c.; diamond pattern plates, ¼ in., 5.30c.; ⅜ in., 5.50c.; spring steel, 5c.; rounds and hexagons, cold-rolled steel, 3.90c.; squares and flats, cold-rolled steel, 4.40c.; steep hoops, 4.25c. base; steel bands, No. 12 gage to ⅝ in., inclusive, 3.90c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

Imports.—Last week's imports of pig iron were 2038 tons from Calcutta and 1000 tons from England. Two hundred and fifty tons of iron bars came in from Sweden. Other imports were negligible.

Old Material.—The market for scrap has become firmer. Prices remain unchanged, except in the case of heavy axle turnings, which have advanced 50c. and now are quoted at \$15.50 to \$16. With the market for pig iron rising, it is the belief of scrap dealers that old material will follow with growing demand from melters both in the steel and foundry industries. One prominent nearby steel interest closed during the past week for 3000 tons of heavy melting at \$17.50 and for 500 tons at \$17.25. Some dealers, however, are making \$18, but no sales at this figure have as yet been reported. Sales of fair sized tonnages of steel turnings have been made in this district the past week at \$15, one lot including 5000 tons.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	\$17.00 to \$17.50
Scrap rails	17.00 to 17.50
Steel rails for rolling	18.50 to 19.00
No. 1 low phos. heavy 0.04 and under	22.00 to 22.50
Couplers and knuckles	21.50 to 22.00
Roller steel wheels	21.50 to 22.00
Cast iron car wheels	18.50 to 19.00
No. 1 railroad wrought	18.50 to 19.00
No. 1 yard wrought	17.00 to 17.50
No. 1 forge fire	14.50 to 15.50
Bundled sheets (for steel works)	14.50 to 15.00
Mixed borings and turnings (for blast furnace use)	13.50 to 14.00
Machine shop turnings (for steel works use)	14.50 to 15.00
Machine shop turnings (for rolling mill use)	14.50 to 15.00
Heavy axle turnings (or equivalent)	15.50 to 16.00
Cast borings (for steel works and rolling mill)	14.50
Cast borings (for chemical plant)	16.50 to 17.00
No. 1 cast	18.00 to 18.50
Heavy breakable cast (for steel plant)	17.00 to 17.50
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	14.50 to 15.00
Wrought iron and soft steel pipes and tubes (new specifications)	16.50
Shafting	23.00 to 24.00
Steel axles	24.00 to 25.00

American Refractories Institute Meets

The American Refractories Institute concluded on Oct. 29 a two-day session at the Waldorf-Astoria Hotel, New York. The institute was founded one year ago as an outgrowth of the Association of Manufacturers of Refractories, which had been in existence about nine years. More than 100 members, coming from as far away as Texas and California, were in attendance. That the industry has attained important proportions is evidenced by the fact that the yearly production of refractories—fire resisting materials—has reached a value of \$75,000,000.

William C. Sproul, formerly Governor of Pennsylvania, and chairman of the board of the General Refractories Co., is president of the institute. In addition to the opening address by Governor Sproul, talks were given by the following:

J. D. Ramsey, president Elk Fire Brick Co., St. Marys, Pa., "The American Refractories Institute and Its Aims"; "Research in Refractories," by W. A. Carter, Detroit Edison Co.; "Service Conditions in Boiler Furnaces as Affecting Refractories," by Ralph Sherman, United States Bureau of Mines, Chicago; "Shrinkage of Diaspore," by S. M. Phelps, Fellow of the Mellon Institute, University of Pittsburgh; "Firebrick Specifications," by J. S. McDowell, Harbison-Walker Refractories Co., Pittsburgh; "Refractories Fellowships at the Mellon Institute," by N. C. Boozé, Senior Fellow of the Mellon Institute of Industry and Research.

A report of the research committee was made by P. S. Kier, chairman Kier Firebrick Co., Pittsburgh, and W. H. Patchell, past-president of the Institute of Mechanical Engineers (England) delivered an address on "Refractories."

Malleable Castings Production Far Above Last Year

WASHINGTON, Oct. 30.—Malleable castings produced in September in 142 plants are reported by the Department of Commerce at 58,573 tons, an increase of 3 per cent over the 56,829 tons in August and of 41 per cent over the 41,507 tons from 138 plants in September, 1924. For 130 identical plants the September output was 54,943 tons, against 53,221 tons in August and 39,261 tons one year ago.

Shipments in September were 54,110 tons, a gain on the 52,543 tons of August. Orders booked were for 49,832 tons, an increase of 2.4 per cent over the 48,691 tons of August. As the monthly capacity of the 142 plants reporting is 114,217 tons, September production represented 51.3 per cent of capacity, compared with 49.6 per cent in August and 36.9 per cent one year ago.

Canadian Mills Active

TORONTO, ONT., Oct. 31.—Orders for rails and railroad equipment placed by the Canadian lines continue to have a stimulating effect on the mill activities of this country. R. J. Kelly, general manager of the British Empire Steel Corporation, Sydney, N. S., has announced the placing of an order for 53,213 tons of steel with his corporation. This order includes 43,320 tons of 85 and 100-lb. rails, 6950 tons of tie plates, 2225 tons of angle bars, 816 tons spikes and track bolts.

The Algoma Steel Corporation, Sault Ste. Marie, Ont., is also running to capacity with orders for about 60,000 tons of rails and other forms of steel for the Canadian Pacific and Canadian National Railways.

The Steel Co. of Canada, Ltd., Hamilton, Ont., is operating at about 70 per cent capacity and reports a good flow of orders of a miscellaneous character. On bars it is now giving delivery in from four to six weeks, and on black sheets in from four to five weeks. The nail and wire mills at Hamilton are also running close to capacity and the general outlook is much better than it has been for several months.

The general improvement in the mill activity has not extended to foundries and, with the exception of some stove foundries and an occasional foundry sup-

plying castings for the automotive industry, operations do not exceed 50 per cent capacity.

British pig iron offered in the Canadian market has resulted in the dropping of the differential between No. 1 and No. 2 foundry iron in the Montreal market, but has not affected Ontario prices. It is expected, however, that with the close of navigation on the St. Lawrence the differential will be restored. Canadian pig iron prices are as follows: No. 1 (2.25 to 2.75 silicon), \$24.85; malleable, \$24.85; No. 2 (1.75 to 2.25 silicon), \$24.35, Toronto. Montreal prices on all grades of Canadian pig iron are \$27.25. Summerlee and Carron (imported) iron are but slightly higher than prices quoted on Canadian iron.

To Discuss Blast Furnace Problems

An all-day conference on blast furnaces, with papers and discussions on construction, stoves, blowing power and research will be held in the Blue Room, William Penn Hotel, Pittsburgh, Thursday, Nov. 12. The conference is under the auspices of the steel works section of the Engineers Society of Western Pennsylvania, and an invitation to attend has been extended to every blast furnace superintendent in the country.

New Quarters for Miles Machinery Co.

The Miles Machinery Co. is now moving into new and larger quarters just purchased and remodeled at 900-922 South Niagara Street, corner Waller Street, Saginaw, Mich. The new plant contains about 25,000 sq. ft. floor area in a well-lighted building with joint switch tracks at the door. This will house the storage warehouse, rebuilding shops and offices. Care has been taken in arranging and equipping the machine shop for rebuilding used machinery, new appliances being added for remachining and testing rebuilt machine tools. The storage space is only about sufficient for present stock and further construction is contemplated to take care of increasing business.

Sales Executives to Meet in St. Louis

A meeting of sales executives, known as the fourth conference of the sales executives' division of the American Management Association, will be held at St. Louis at the Hotel Chase, Dec. 3 and 4, in cooperation with the sales managers' bureau of the St. Louis Chamber of Commerce.

"Organizing Salesmen's Time" will be discussed by C. J. Stillwell, sales manager Warner & Swasey Co., Charles A. Steffey, general sales manager National Cash Register Co., and Clement Ehret, general sales manager International Business Machine Co.

"Introducing a New Product" will be discussed among others by J. A. Harlan, sales manager Frigidaire Division, Delco Light Co.

"Fixing the Salesman's Task" will be discussed by L. V. Britt, general sales manager Burroughs Adding Machine Co., and others.

"Branch Office Management" will be discussed by W. C. Dunlap, vice-president American Multigraph Co., and F. M. Payne, vice-president White Sewing Machine Co.

R. B. Flershem, vice-president American Radiator Co., is chairman of the program committee.

Safety Poster Contest for High Schools

A national art poster contest for high school pupils has been inaugurated by the National Safety Council, Chicago. The subject of the posters will be safety and the interest which the contest arouses is expected to stimulate education in accident prevention. In a letter to 4000 superintendents of schools in this country, W. H. Cameron, managing director of the council, suggests that adequate time, support and materials be allowed for the contest and that some other form of award be offered in place of money, preferably a reproduction or actual work of artistic merit.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....1.80c. to 1.90c.
F.o.b. Chicago, base, per lb.....2.10c.

Structural Shapes

F.o.b. Pittsburgh mill, base, per lb.....1.90c. to 2.00c.
F.o.b. Chicago, base, per lb.....2.10c.

Iron and Steel Bars

Soft steel bars, f.o.b. P'gh mills, base, per lb.....2.00c.
Soft steel bars, f.o.b. Chicago, base, per lb.....2.10c.
Reinforcing steel bars, f.o.b. P'gh mills, per lb.....2.00c.
Rail steel bars, f.o.b. Chicago, base, per lb.....2.00c. to 2.10c.
Common iron bars, f.o.b. Chicago, base, per lb.....1.90c. to 2.00c.
Refined iron bars, f.o.b. P'gh mills, base, per lb.....3.00c.
Common iron bars, eastern Pa. mill, base, per lb.....2.10c.

Hot-Rolled Flats (Hoops, Bands and Strips)

All gages, narrower than 6 in., base per lb., Pitts-
burgh.....2.50c.
All gages, 6 in. and wider, base per lb., P'gh.....2.30c.
All gages, 6 in. and narrower, Chicago.....2.60c.
All gages, wider than 6 in., Chicago.....2.50c.
Cotton ties, per 45 lb. bundle, f.o.b. Atlantic ports.....\$1.28
Cotton ties, per 45 lb. bundle, f.o.b. Gulf ports.....1.25

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb.,
burgh.....2.40c. to 2.50c.
Screw stock and shafting, f.o.b. Chicago, base, per lb.....2.50c.
Screw stock, base, per lb., Cleveland.....2.55c.
Shafting, ground, f.o.b. mill, base, per lb.....*2.80c. to 3.00c.
Strips, f.o.b. P'gh mills, base, per lb.....3.90c.
Strips, f.o.b. Cleveland mills, base, per lb.....3.90c.
Strips, delivered Chicago, base, per lb.....4.20c.
Strips, f.o.b. Worcester mills, base, per lb.....4.05c.

*According to size.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg.....\$2.65
Galvanized nails, 1-in. and longer, base plus.....2.00
Galvanized nails, shorter than 1 in., base plus.....2.25
Bright plain wire, base, No. 9 gage, per 100 lb.....2.50
Annealed fence wire, base, per 100 lb.....2.65
Spring wire, base, per 100 lb.....3.50
Galvanized wire, No. 9, base, per 100 lb.....3.10
Galvanized barbed, base, per 100 lb.....3.35
Galvanized staples, base, per keg.....3.35
Painted barbed wire, base, per 100 lb.....3.10
Polished staples, base, per keg.....3.10
Cement coated nails, base, per count keg.....1.80
*Bale ties, carloads, to jobbers...75, 15 and 5 per cent off list
*Bale ties, carloads, to retailers...75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers.....\$65
Chicago district mill and delivered Chicago prices are \$1
per ton above the foregoing. Birmingham mill prices \$3 a
ton higher; Worcester, Mass., mill \$3 a ton higher on produc-
tion of that plant; and Duluth, Minn., mills \$2 a ton higher;
Anderson, Ind., \$1 higher.

*F.o.b. Cleveland.

Sheets

Blue Annealed
(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh.....2.40c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills.....2.50c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh.....3.25c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.35c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh.....4.50c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....4.60c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh.....3.25c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....3.35c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. Pittsburgh.....4.40c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....4.75c.

Tin Plate

Standard cokes, per base box, f.o.b. Pittsburgh district
mills.....\$5.50
Standard cokes, per base box f.o.b. Chicago district mills 5.60
Standard cokes, per base box f.o.b. Elwood, Ind.....5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....\$11.20	20-lb. coating I. C....\$15.50
8-lb. coating I. C....11.50	25-lb. coating, I. C....17.00
15-lb. coating I. C....14.35	30-lb. coating I. C....18.35
	40-lb. coating I. C....20.35

Rivets

Large, f.o.b. Pittsburgh, base, per 100 lb.....\$2.60
Large, f.o.b. Cleveland, base, per 100 lb.....\$2.60 to 2.70
Large, f.o.b. Chicago, base, per 100 lb.....2.75
Small, f.o.b. Pittsburgh.....70, 10 and 5 per cent off list
Small, Cleveland.....70, 10 and 5 to 70, 10 and 10 off list
Small, Chicago.....70, 10 and 10 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton.....\$43.00
Rails, light, billet, base, per lb.....1.65c. to 1.70c.
Rails, light, rail steel, base, per lb.....1.50c. to 1.60c.
Spikes, $\frac{3}{4}$ in. and larger, base, per 100 lb.....\$2.80 to \$3.00
Spikes, $\frac{1}{2}$ in. and smaller, base, per 100 lb.....3.00 to 3.25
Spikes, boat and barge, base, per 100 lb.....3.25
Track bolts, all sizes, base, per 100 lb.....3.90 to 4.25
Tie plates, per 100 lb.....2.35 to 2.40
Angle bars, base, per 100 lb.....2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Inches	Steel	Galv.	Inches	Iron	Galv.
$\frac{1}{4}$	45	19 $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$	+11	+39
$\frac{1}{2}$ to $\frac{3}{4}$	51	25 $\frac{1}{2}$	$\frac{1}{2}$	22	3
$\frac{1}{2}$	56	42 $\frac{1}{2}$	$\frac{3}{4}$	28	11
$\frac{3}{4}$	60	48 $\frac{1}{2}$	1 to 1 $\frac{1}{2}$	30	13
1 to 3.....	62	50 $\frac{1}{2}$			

Lap Weld

2.....	55	43 $\frac{1}{2}$	2.....	23	7
2 $\frac{1}{2}$ to 6.....	59	47 $\frac{1}{2}$	2 $\frac{1}{2}$	26	11
7 and 8.....	56	43 $\frac{1}{2}$	3 to 6.....	28	13
9 and 10.....	54	41 $\frac{1}{2}$	7 to 12.....	26	11
11 and 12.....	53	40 $\frac{1}{2}$			

Butt Weld, extra strong, plain ends

$\frac{1}{4}$	41	24 $\frac{1}{2}$	2 to 3.....	61	50 $\frac{1}{2}$
$\frac{1}{4}$ to $\frac{3}{8}$	47	30 $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$	+11	+54
$\frac{1}{2}$	53	42 $\frac{1}{2}$	$\frac{1}{2}$	21	7
$\frac{3}{4}$	58	47 $\frac{1}{2}$	$\frac{3}{4}$	28	12
1 to 1 $\frac{1}{2}$	60	49 $\frac{1}{2}$	1 to 1 $\frac{1}{2}$	30	14

Lap Weld, extra strong, plain ends

2.....	53	42 $\frac{1}{2}$	2.....	23	9
2 $\frac{1}{2}$ to 4.....	57	46 $\frac{1}{2}$	2 $\frac{1}{2}$ to 4.....	29	15
4 $\frac{1}{2}$ to 6.....	56	45 $\frac{1}{2}$	4 $\frac{1}{2}$ to 6.....	28	14
7 to 8.....	52	39 $\frac{1}{2}$	7 to 8.....	21	7
9 and 10.....	45	32 $\frac{1}{2}$	9 to 12.....	16	2
11 and 12.....	44	31 $\frac{1}{2}$			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 $\frac{1}{2}$ point, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2 $\frac{1}{2}$ per cent beyond the above discount.

NOTE—The above discounts on steel pipe also apply at Lorain, Ohio. Chicago district mills have a base 2 points less. Chicago delivered base 2 $\frac{1}{2}$ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel	Charcoal Iron
2 to 2 $\frac{1}{4}$ in.....	27
2 $\frac{1}{2}$ to 2 $\frac{3}{4}$ in.....	37
3 in.....	40
3 $\frac{1}{4}$ to 3 $\frac{3}{4}$ in.....	42 $\frac{1}{2}$
4 to 13 in.....	46
	1 $\frac{1}{4}$ in.....
	1 $\frac{1}{2}$ to 1 $\frac{3}{4}$ in.....
	2 to 2 $\frac{1}{4}$ in.....
	2 $\frac{1}{2}$ to 3 in.....
	3 $\frac{1}{4}$ to 4 $\frac{1}{2}$ in.....

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.....	60	3 in.....	45
1 $\frac{1}{4}$ to 1 $\frac{1}{2}$ in.....	52	3 $\frac{1}{4}$ to 3 $\frac{1}{2}$ in.....	47
1 $\frac{3}{4}$ in.....	36	4 in.....	50
2 to 2 $\frac{1}{4}$ in.....	31	4 $\frac{1}{2}$, 5 and 6 in.....	45
2 $\frac{1}{2}$ to 2 $\frac{3}{4}$ in.....	39		

Hot Rolled

2 and 2 $\frac{1}{4}$ in.....	34	3 $\frac{1}{4}$ and 3 $\frac{1}{2}$ in.....	50
2 $\frac{1}{2}$ and 2 $\frac{3}{4}$ in.....	42	4 in.....	53
3 in.....	48	4 $\frac{1}{2}$, 5 and 6 in.....	48

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing (New List)

Carbon 0.10 to 0.30 base.....50 to 55 per cent off list
Carbon 0.30 to 0.40 base.....45 to 50 per cent off list
Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 51.50 per cent iron.....	\$4.55
Old range non-Bessemer, 51½ per cent iron.....	4.40
Mesaba Bessemer, 51.50 per cent iron.....	4.40
Mesaba non-Bessemer, 51.50 per cent iron.....	4.25
High phosphorus iron, 51.50 per cent.....	4.15

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus	45c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates	\$12.00 to \$13.00
Chrome ore, Indian basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f. Atlantic seaboard..	\$22.50 to \$24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₃ , New York.....	65c. to 70c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt.....	\$8.00
Foundry coke, f.o.b. Connellsville prompt.....	9.00
Mine run steam coal, f.o.b. W. Pa. mines.....	1.50 to 2.10
Mine run coking coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Mine run gas coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.25 to 1.35
Gas slack, f.o.b. W. Pa. mines.....	1.40 to 1.50

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	115.00
Ferrosilicon, 50 per cent, delivered.....	\$2.50 to \$5.00
Ferrosilicon, 75 per cent.....	145.00 to 147.50
Ferrotungsten, per lb. contained metal.....	1.15 to 1.20
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered.....	11.50c.
Ferrovanadium, per lb. contained vanadium	\$3.50 to \$4.00
Ferrocobalt, per lb. contained cobalt, 15 to 18 per cent, net ton.....	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$32.00 to \$34.00
Spiegeleisen, domestic, 16 to 19 per cent.....	31.00 to 33.00
Ferrosilicon, Bessemer, 10 per cent, \$34; 11 per cent, \$36; 12 per cent, \$38; electric furnace ferrosilicon, 10 per cent, \$38 furnace; 11 per cent, \$38; 12 per cent, \$38; 14 to 16 per cent, \$45.	
Silvery iron, 6 per cent, \$26.50; 7 per cent, \$27.50; 8 per cent, \$28.50; 9 per cent, \$30; 10 per cent, \$32; 11 per cent, \$34; 12 per cent, \$36.	

Fluxes and Refractories

Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, gravel, per net ton, f.o.b. Illinois and Kentucky mines	\$16.00 to \$17.00
No. 2 lump, per net ton.....	19.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton.....	16.00
Fluorspar, No. 1 ground bulk, 95 to 98 per cent calcium fluoride, not over 2½ per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	32.50
Per 1000 f.o.b. works:	
Fire Clay	
Pennsylvania.....	43.00 to 46.00
Maryland.....	48.00 to 50.00
Ohio.....	43.00 to 46.00
Kentucky.....	43.00 to 45.00
Illinois.....	43.00 to 45.00
Missouri.....	40.00 to 43.00
Ground fire clay, per ton.....	6.50 to 7.50
Silica Brick:	
Pennsylvania.....	40.00
Chicago.....	49.00
Birmingham.....	54.00
Silica clay, per ton.....	8.00 to 9.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	48.00

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

Machine bolts, small rolled threads..60 and 10 per cent off list	
Machine bolts, all sizes, cut threads, 50, 10 and 10 per cent off list	
Carriage bolts, smaller and shorter, rolled threads, 50, 10 and 10 per cent off list	
Carriage bolts, cut threads, all sizes..50 and 10 per cent off list	
Eagle carriage bolts.....	65 and 10 per cent off list
Lag bolts.....	60, 10 and 10 per cent off list
Flow bolts, Nos. 3 and 7 heads.....	50 and 10 per cent off list
Other style heads.....	30 per cent extra

Machine bolts, c.p.c. and t. nuts, ¼ x 4 in.

Larger and longer sizes.....	45, 10 and 5 per cent off list
Hot-pressed nuts, blank and tapped, square.....	4c. off list
Hot-pressed nuts, blank or tapped, hexagons.....	4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped.....	4.10c. off list
Bolt ends with hot pressed nuts..50, 10 and 10 per cent off list	
Bolt ends with cold pressed nuts..45, 10 and 5 per cent off list	
Washers.....	6.50c. to 6.25c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits.)

Semi-finished hex. nuts:

¾ in. and smaller, U. S. S.....	80 and 5 per cent off list
¾ in. and larger, U. S. S.....	75 and 5 per cent off list
Small sizes, S. A. E.....	80, 10 and 5 per cent off list
S. A. E., ¾ in. and larger.....	75, 10 and 5 per cent off list
Stove bolts in packages.....	80, 10 and 5 per cent off list
Stove bolts in bulk.....	80, 10, 5 and 2½ per cent off list
Tire bolts.....	60 and 5 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)
(To jobbers and consumers in large quantities)

Per 100 Net		Per 100 Net	
S. A. E.	U. S. S.	S. A. E.	U. S. S.
¾ in.	\$0.54	¾ in.	\$2.45
¾ in.	0.615	¾ in.	3.80
¾ in.	0.72	¾ in.	5.85
¾ in.	0.89	¾ in.	9.10
¾ in.	1.11	¾ in.	12.80
¾ in.	1.48	¾ in.	18.55
¾ in.	1.80	¾ in.	21.20

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws.....	80 and 10 per cent off list
Milled standard set screws, case hardened.....	80 per cent off list
Milled headless set screws, cut thread.....	80 per cent off list
Upset hex. head cap screws, U. S. S. Thread.....	80, 10 and 10 per cent off list
Upset hex. cap screws, S. A. E. Thread.....	80 and 10 per cent off list
Upset set screws..80, 10 and 10 to 80, 10 and 25 per cent off list	
Milled studs.....	70 and 5 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$35.00
Forging billets, ordinary.....	40.00
Forging billets, guaranteed.....	45.00
Sheet bars.....	35.00
Slabs.....	35.00
*Wire rods, common soft, base, No. 5 to ¾ in.....	45.00
Wire rods, common soft, coarser than ¾ in.....	\$2.50 over base
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp, grooved, per lb.....	1.90c.
Skelp, sheared, per lb.....	1.90c.
Skelp, universal, per lb.....	1.90c.

*Chicago mill base is \$46. Cleveland mill base, \$45.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E.	Series	Numbers	Bars 100 lb.
2100*	(¼% Nickel, 10 to 20 per cent Carbon).....		\$3.20 to \$3.30
2300	(¾% Nickel).....		4.55 to 4.65
2500	(5% Nickel).....		5.70 to 5.80
3100	(Nickel Chromium).....		3.50 to 3.60
3200	(Nickel Chromium).....		5.10 to 5.20
3300	(Nickel Chromium).....		7.20 to 7.30
3400	(Nickel Chromium).....		6.45 to 6.50
5100	(Chromium Steel).....		3.60 to 3.70
5200*	(Chromium Steel).....		7.50 to 8.25
6100	(Chromium Vanadium bars).....		4.30 to 4.40
6100	(Chromium Vanadium spring steel).....		3.85
9250	(Silicon Manganese spring steel).....		3.30
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium).....			4.20 to 4.45
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....			4.40 to 4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....			4.35 to 4.45
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....			3.50 to 3.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum).....			4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

NON-FERROUS METALS

The Week's Prices

		Copper, New York		Straits (Spot)		Lead		Zinc	
		Lake	Electro- lytic*	New York	New York	St. Louis	New York	St. Louis	
Oct.									
28.....	14.75	14.37½	63.00	9.65	9.30	8.90	8.55		
29.....	14.75	14.37½	63.85	9.70	9.40	8.95	8.60		
30.....	14.75	14.50	64.00	9.75	9.50	9.00	8.65		
31.....	14.75	14.50		9.75	9.50	9.00	8.65		
Nov.									
2.....	14.75	14.50	63.62½	9.85	9.50	9.02½	8.67½		

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Nov. 2.

The volume of business continues moderately large in all the markets. After a slight recession, copper is stronger. Tin maintains its advance on good buying. Lead is higher because of increasing scarcity. Zinc is steady and strong.

Copper.—The market today has been quite active with inquiry on a fairly large scale. This is due largely to a feeling on the part of consumers that prices are not again going lower. Sales of electrolytic have been made at 14.75c., delivered, and several large producers are asking 14.87½c. During the past week a fairly large volume of business has been done, mostly domestic. Foreign orders are not plentiful, but it is reported that 14.85c., c.i.f., has been realized recently. The absence of speculative copper at the close of October was unusual, but is regarded as a good sign. Some producers are so sanguine as to basic conditions that they predict an active and rising market for the rest of the year. Lake copper is quoted at 14.75c. to 14.87½c., delivered.

Copper Averages.—The average price for Lake copper for the month of October, based on daily quotations in THE IRON AGE, was 14.66c., delivered. The average price of electrolytic copper was 14.29c., refinery, or 14.54c., delivered.

Tin.—Sales for the week are estimated at 1000 to 1200 tons, which is regarded as very good. Consumers were quite active buyers, mostly for prompt, November and December delivery New York. The opinion prevails that they will still need more metal, particularly for December, and that good buying for the first quarter is likely to develop early. As a whole, the market maintains its strength and rising tendency. Prices in London today were about £1 per ton higher than a week ago, with spot standard quoted at £285 7s. 6d., future standard at £283 7s. 6d. and spot Straits at £295 10s. The Singapore price was £290 10s. The market here today was only moderately active, with spot Straits quoted at 63.62½c., New York. Arrivals to Oct. 30 had been 6125 tons with 4875 tons reported afloat. As to the visible world supply, preliminary statistics indicate a reduction of about 2000 tons, bringing the total down to approximately 16,000 tons. While this may be regarded as unfavorable to consumers, it is predicted that statistics for Dec. 1 and Jan. 1 will show increases.

Lead.—The market has been gradually getting stronger and the metal is scarce and difficult to obtain. Sales have been made as high as 9.55c., St. Louis, for prompt delivery, and there is not much November lead being offered. The total volume of business being done is small because there is not much lead available. The leading interest advanced its New York contract price from 9.50c. to 9.75c. today. In the outside market quotations are higher at 9.50c., St. Louis, or 9.85c., New York, as a reasonable average.

Zinc.—There is very little change in the situation now as compared with a week ago. Prices are a little higher after a moderate recession during the week, with prime Western quoted at 8.65c. to 8.70c., St. Louis, or 9c. to 9.05c., New York, with spot selling at 8.75c. to 8.80c., St. Louis. As heretofore the strength of the market is due largely to foreign demand. Domestic consumers, particularly galvanizers, are slow to place

orders at present levels and many of them are buying only what they need from time to time.

Nickel.—Wholesale lots of ingot nickel are quoted at 34c. with shot nickel at 35c. Electrolytic nickel is unchanged at 38c. per lb.

Antimony.—Chinese metal for prompt and early delivery is becoming scarcer and prices are higher. Spot metal is quoted today at 20c., duty paid, with November-December arrival quoted at 18.75c. to 19c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb.

Old Metals.—The market is strong. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	14.25
Copper, heavy and wire	13.25
Copper, light and bottoms	11.50
Heavy machine composition	10.25
Brass, heavy	8.75
Brass, light	7.75
No. 1 red brass or composition turnings ..	9.75
No. 1 yellow rod brass turnings	9.50
Lead, heavy	8.75
Lead, tea	7.00
Zinc	6.00
Cast aluminum	21.50
Sheet aluminum	21.50

Chicago

Nov. 2.—Tin, lead, zinc and antimony have advanced slightly due to the influence of good buying. Copper remains unchanged. No price changes have taken place among the old metals. We quote in carload lots: Lake copper, 14.75c.; tin, 65c.; lead, 9.55c.; zinc, 8.75c.; in less than carload lots, antimony, 21c. On old metals we quote copper wire, crucible shapes and copper clips, 11.50c.; copper bottoms, 10c.; red brass, 9c.; yellow brass, 7.75c.; lead pipe, 8c.; zinc, 5.25c.; pewter, No. 1, 36c.; tin foil, 44c.; block tin, 52c.; all being dealers' buying prices for less than carload lots.

FOREIGN BUYING LIGHT

Small Purchases by Japan—American Importers Active on Steel and Coke

NEW YORK, Nov. 2.—Foreign inquiry for iron and steel continues small with Japanese purchasing providing most of the current activity. Demand from South American markets is light and the Chinese markets are quiet, probably as a result of the renewal of warfare between the political factions. In Japan, the inquiry of the Ogura Oil Co., for 12,500 base boxes of tin plate was awarded to Iwai & Co., New York. A tonnage of 4100 base boxes is being inquired for by the Tokyana Naval Fuel Department.

Small purchases of rails are the only other feature of the present Japanese market. Tokio municipality has closed with Mitsui & Co. on three miles of 91-lb. high T-rails with splice bars and has issued a call for bids on an additional tonnage of the same specifications including two miles of 100-lb. guard rails, bids on which opened Nov. 1. Bids have been opened on the 300,000 ft. of gas pipe for the Tokio Gas Co., but some exporters point out that, in view of the trial tonnage of about 100,000 ft. of such pipe placed with a French maker last spring, the present lot may go to Europe, provided the trial order proved satisfactory.

American importers continue to make their presence felt in various markets, steel, pig iron and coke. A recent award of business to a European mill was the purchase of about 600 tons of reinforcing bars for a Brooklyn, N. Y., sewer contract. The material was open-hearth steel and is understood to have been placed with the importer who booked 5500 tons of bars for the same sewer work about a year ago. In coke, the German product is apparently being quoted at the lowest prices, run of the oven still being obtainable, according to importers, at \$8 to \$8.25 per ton, c.i.f. Atlantic port.

A report that is interesting both importers and exporters is from Germany to the effect that the German state railroads have placed a total of 360,000 tons of rails with German mills for delivery up to the end of next spring. Should this be true, it is pointed out that for a time German sellers would probably be less interested in rail business.

H. D. Williams Heads Pittsburgh Steel Co. and W. G. Clyde Carnegie

Homer D. Williams is president of the Pittsburgh Steel Co. Rarely has a change in the presidency of a company caused more interest in steel trade circles than this sudden and unexpected shift of the head of



H. D. WILLIAMS



W. G. CLYDE

the Carnegie Steel Co., the largest unit of the United States Steel Corporation, to an independent company. The Pittsburgh Steel Co. had hardly completed the recasting of its financial structure in connection with the absorption of the Pittsburgh Steel Products Co. last August before there were reports of a change, but it has been only in the past week that there had been audible suggestions of the possibility that Mr. Williams would be the new head of the company and such suggestions were not regarded very seriously, because of Mr. Williams' long connection with the Carnegie Steel Co.

The announcement that Mr. Williams had accepted the presidency of the company followed a meeting on Oct. 29, of the new board of directors of the Pittsburgh Steel Co., chosen at the annual meeting of the stockholders on Oct. 27.

Other officers of the Pittsburgh Steel Co. are Emil Winter and Edward H. Bindley, vice-presidents; Henry J. Miller, secretary; W. C. Reitz, treasurer; Ray Maxwell, assistant secretary, and Wallace L. Rowe, Jr., assistant treasurer. The board of directors elected at the annual meeting of the stockholders on Oct. 27 are: Homer D. Williams, Emil Winter, Edward H. Bindley, Charles E. Beeson, H. C. McEldowney, W. C. Reitz, Henry J. Miller, Wallace L. Rowe, Jr., Albion Bindley, Dwight Winter, W. Edgar Reed of Pittsburgh and James Speyer of New York.

William G. Clyde, vice-president and general manager of sales Carnegie Steel Co., Pittsburgh, meanwhile was elected president of the company to succeed Homer D. Williams. Mr. Clyde was born in Chester, Pa., and received his education in the public schools of that city, and the Pennsylvania Military College, from which he was graduated in the class of 1888, and from which he received in June, 1924, the honorary degree of Doctor of Applied Science. He has been active since in the steel business and while most of that time engaged in a sales capacity he had several years of shop and mill practice. He started as a civil engineer with Ryan & McDonald, a steel construction firm in Baltimore, and later became associated with Robert Wetherill & Co., machinists and founders of Chester. He secured valuable mill training while with the Wellman Steel & Iron Co., Thurlow, Pa., where he was superintendent of the plate mill, and subsequently with the Illinois Steel Co., at South Chicago, where he was employed for six years. Leaving the latter company, Mr. Clyde became district sales manager American Steel Hoop Co. at Philadelphia, remaining in that position until that company was taken over by the Carnegie Steel Co. in 1900. After

spending three years in sales work at the Cleveland office of the Carnegie Steel Co., Mr. Clyde was made assistant general sales manager of the company with headquarters at Pittsburgh, and in March, 1918, he was made vice-president and general manager of sales of the company. His elevation to the presidency of the Carnegie company broke a precedent in not making the succession directly from the operating department. Mr. Clyde is a member of the Masonic fraternity, of the Bankers' Club of New York, the Seaview Golf Club of Absecon, N. J., the Engineers Society of Western Pennsylvania, the Pilgrims of New York, the Pittsburgh Club, Pittsburgh Athletic Association, Duquesne Club, University Club and the Country Club, and is a director of the United States Steel and Carnegie Pension Fund, and of the Bank of Pittsburgh.

PITTSBURGH, Nov. 2.—Homer D. Williams and William G. Clyde assumed their new positions on Monday, and their offices were more like conservatories than places of business. Telegrams, letters and verbal expressions were numbered by hundreds. In both offices regular business gave place to receptions to the new executives. It is something of a novelty for the Carnegie Steel Co. to have a new president, as it is 11 years since Mr. Clyde's predecessor was chosen. Something of a precedent was broken in the election of Mr. Clyde to the presidency, because not since the chairmanship of H. C. Frick has the company had a head who has not come direct from the mills. Mr. Clyde, except for a few years early in his connection with the steel industry, when he had some experience as an Illinois Steel Co. plate mill superintendent, has been engaged in sales capacities. His friends tell of the great loss steel salesmanship would have suffered had he elected to continue as an operating man. Of great energy and of unusual personality, he combines executive ability with a large endowment of friendliness. His selection is a popular one with officials of his own company and those of other Steel Corporation subsidiaries.

Meanwhile, there is great satisfaction among officials and employees of the Pittsburgh Steel Co. over the advent of Mr. Williams, who is expected to handle the affairs of that company in the same efficient way that has marked his Carnegie administration.

PERSONAL

A. M. Conneen, Jr., has been elected president of the Hedden Iron Construction Co., New York, succeeding Eugene B. Hedden, who retired as president on Nov. 2. Mr. Conneen has been identified with the Hedden company for a number of years, following his representing the Bethlehem Steel Co. as sales representative in New York for its plate and structural steel departments.

Lloyd H. Atkinson has resigned as vice-president of Rogers, Brown & Crocker Bros., Inc., New York, to become vice-president of the Bayshore Co. at Jacksonville, Fla., a corporation engaged in industrial and port developments at that point. Mr. Atkinson has been connected with the iron and steel business since 1908, when he was appointed rail sales agent of the Bethlehem Steel Co. Later he became a partner in Crocker Brothers and continued in that connection after the merger with Rogers, Brown & Co.

C. V. Wilt has been placed in charge of operations of the Mackintosh-Hemphill Co., Pittsburgh, in the capacity of assistant to the president. A. H. Baum has been named as second assistant to the president.

Harry Llewellyn, formerly general purchasing agent Pittsburgh Steel Products Co., Pittsburgh, has become affiliated with T. L. Rose & Son, Inc., 57 Water Street, Pittsburgh, distributor of Dodge power transmission products, as vice-president.

John H. Bode, who, as announced in THE IRON AGE last week, is the new president of Wellman-Seaver-Morgan Co., Cleveland, also is to be general manager of the company. E. S. Church, who has been president of the company, has been elected chairman of the board of directors. The new president, who recently was vice-president in charge of operations Mackintosh-Hemphill Co., Pittsburgh, has reached a high place in rolling mill engineering over the practical route. He was born in Youngstown, Ohio, Oct. 3, 1886, and after completing the grade and high school courses there, he entered the employ of the Lloyd Booth Co., Youngstown, in its engineering department. When that company was merged with the United Engineering & Foundry Co., Pittsburgh, he was transferred to Pittsburgh. Later he was with the Seamless Tube Co. of America (Pittsburgh Steel Products Co.), the Carnegie Steel Co., Pittsburgh, and the Mesta Machine Co., Pittsburgh. He was successively chief draftsman, chief engineer and vice-president in charge of operations while affiliated with the Mackintosh-Hemphill Co., being appointed to the latter position in August, 1923.

Emmett B. Carter has resigned a two years' connection with Barrett Co., New York, to become consulting engineer of the Tannin Corporation, 100 East Forty-second Street, New York. For some years he was chief engineer of the Midvale Steel Co., and subsequently of the Midvale and Cambria plants of the Midvale Steel & Ordnance Co.

G. S. Warren, vice-president A. P. Munning & Co., with headquarters at Chicago, recently resigned to become vice-president and general manager of William H. Keller, Inc., Grand Haven, Mich., manufacturer of pneumatic tools.

Edward B. Wickes has been elected vice-president of the Wickes Boiler Co., Saginaw, Mich., and Henry E. Aldrich has been appointed as general sales manager.

Frederick M. Becket has been elected vice-president of Union Carbide Co., New York.

H. Farrow has been appointed manager of the stamping department of the Transue-Williams Steel Forging Co., Alliance, Ohio, succeeding Carl Allcorn, who has retired.

Wm. T. B. Miller, for seven years with Morris-Wheeler & Co., has joined the sales force of Horace T. Potts & Co., Philadelphia.

Horatio S. Schroeder, formerly general sales manager, Interstate Iron & Steel Co., Chicago, has been elected vice-president in charge of sales. He started with the Interstate company in 1915 as manager of the New York office. In March, 1923, he was transferred to the Chicago office to become division sales manager and in September, 1924, was appointed general sales manager.

Waldo Mills Pitken, 722 Canal Street, New Orleans, has been appointed sales agent in New Orleans and part of Louisiana, for the Newport Rolling Mill Co., Newport, Ky.

F. M. Cross, formerly manager of the New York pneumatic tool department of the Ingersoll-Rand Co., 11 Broadway, New York, has been appointed manager of the same department for the Chicago territory, with headquarters at Chicago.

John A. Camm has resigned as general sales and advertising manager for the W. F. & John Barnes Co., Rockford, Ill.

L. H. Bittner, purchasing agent for the Atlas Alloy Steel Corporation, Dunkirk, N. Y., since 1922, has been transferred to the Pittsburgh office of that company in the capacity of assistant sales manager. Walter Bould will become purchasing agent at Dunkirk.

H. P. Mackinnon has joined the Great Lakes Foundry Sand Co., Detroit, in a sales and engineering capacity. He has been affiliated with the foundry in-

dustry in an executive capacity for the past 20 years and for the last eight years as sales engineer with the Wm. H. Nicholls Molding Machine Co., Brooklyn, N. Y.

James A. Galligan, vice-president Mortimer B. Flynn Coal Co., Chicago, became associated with the Union Railway Equipment Co., Chicago, on Nov. 1. He will be identified principally with the sales department and will devote particular attention to the further introduction of a patented high power hand brake, which is already standard equipment on several railroads. Mr. Galligan will again have headquarters in the McCormick Building, where he was located for many years. Prior to his connection with the coal business, he was assistant to the president By-Products Coke Corporation, and manager of coke sales for Pickands, Brown & Co., Chicago. He was a pioneer in the introduction of by-product coke in the Middle West. Before going to Chicago in 1908, he was assistant general purchasing agent of the Allis-Chalmers Mfg. Co. at Milwaukee.

OBITUARY

GEORGE ADAMS POST, president George A. Post Co., manufacturer of railroad supplies, and chairman of the Railroad Committee of the United States Chamber of Commerce, died Oct. 31 of a sudden attack of heart disease at his home in Somerville, N. J. He was born at Cuba, N. Y., Sept. 1, 1854, and at 18 entered the freight department of the Erie Railroad. He was advanced to assistant to the superintendent of motive power. At 22 he was elected mayor of Susquehanna, Pa., and six years later was sent to Congress, being the youngest member of the House. He was admitted to the bar in Pennsylvania and was editor of the *Montrose, Pa., Democrat* in 1883-89. Then for two years he was on the *New York World*. In 1892 he entered the railroad supply business as vice-president of the Standard Coupler Co., assuming the presidency in 1894. He helped organize the permanent Railway Supply Manufacturers' Association in 1904 and became the first president of the Railway Business Association in 1909, holding the office for nine years. Mr. Post was a member of the Machinery Club, New York, president in 1911-12, and a member of the Lotos and Railroad clubs. He leaves his wife and one son, George A. Post, Jr., vice-president of the Post company. Mr. Post won fame as an after-dinner speaker and was known widely as "the apostle of good humor."

GEORGE M. BASFORD, head of the G. M. Basford Co., New York, and consulting engineer of the Lima Locomotive Works, whose sudden death in New York, Oct. 26, was mentioned in this column last week, was one of the organizers and has been familiarly called the father of the Railway Signal Association, but was better known for his influence on the improvement of steam locomotive design and utilization. He was born in Boston in 1865, and was graduated from the Massachusetts Institute of Technology in 1889, after which he entered the railroad field, serving as draftsman, and in 1897 was made editor of the *American Engineer and Railroad Journal*, now the *Railway Mechanical Engineer*. In September, 1905, he was made assistant to the president of the American Locomotive Co., and in March, 1913, became chief engineer of the railroad department of Joseph T. Ryerson & Son. In March, 1916, he organized the G. M. Basford Co. to handle technical advertising. At about this time he was also made president of the newly organized Locomotive Feedwater Heater Co. and headed it for several years until it was taken over by the Superheater Co.

EDMUND PAULSEN, sales engineer the Little Red Wagon Mfg. Co., Omaha, died Oct. 18, aged 63 years. For 24 years he had been connected with the company and was at one time factory superintendent. L. S. Paulsen, his son, is the present superintendent.

FABRICATED STEEL

Awards Numerous and Total 30,000 Tons—New Bidding Method Effective

Structural awards of the week made up somewhat in volume what they lacked in size. The total reported was about 30,000 tons. The previous week's bookings of 60,000 tons were swollen by a single 20,000 ton building. Activity in the New York district, it is claimed in some quarters, was partly the result of the recent decision of fabricators to quote after Nov. 1 on a contract rather than a pound price basis and accordingly purchasers felt it to their interest to close to secure bidding on the old method. Pending business includes two sizable tonnages, 7000 tons for the Los Angeles, Cal., city hall and 5000 tons for a storage warehouse in New York, bringing the total close to 49,000 tons.

Royal Indemnity Insurance Co., 150 William Street, New York, office building, 5700 tons, to Hay Foundry & Iron Works, New York.

Apartment at 350 East Fifty-seventh Street, New York, 600 tons to Taylor-Fichter Steel Construction, New York.

Office building, Clinton and Joralemon Streets, Brooklyn, N. Y., 810 tons, to Hay Foundry & Iron Works, New York.

New York Central Lines, bridge flooring for Chicago, 750 tons, to McClintic-Marshall Co., Chicago.

Sulka Building, Fifth Avenue, New York, 725 tons, to Harris Structural Steel Co., New York.

Marshall Field, residence, 4 East Seventieth Street, New York, 600 tons, to A. E. Norton, Inc., New York.

Hotel, 331-41 West Ninety-third Street, New York, 1250 tons to A. E. Norton, Inc., New York.

Theater and stores, Roosevelt Avenue, Woodside, L. I., N. Y., 200 tons, to George A. Just Co., New York.

Apartment building, 35 West Ninth Street, New York, 340 tons, to Taylor-Fichter Steel Construction Co., New York.

Apartment building, 350 East Fifty-seventh Street, New York, 450 tons, to Taylor-Fichter Steel Construction Co.

Apartment building, 203 West 106th Street, New York, 760 tons, to Taylor-Fichter Steel Construction Co.

Pennsylvania Railroad, bridge at Steubenville, Ohio, 250 tons, to Jones & Laughlin Steel Corporation.

Power plant, Pittston, Pa., 2700 tons, to American Bridge Co.

Mutual Life Insurance Co., Baltimore, office building, 550 tons, to Lehigh Structural Steel Co., Allentown, Pa.

Palmolive Co., Milwaukee, plant at Edgewater, N. J., 350 tons, to an unnamed fabricator.

State hospital, Creedmore, Long Island, 1600 tons, to an unnamed fabricator.

New York-New Jersey vehicular tunnel, ventilating building, 2100 tons, to the Phoenix Bridge & Iron Co.

Florence Pipe Foundry & Machine Co., Florence, N. J., building, 600 tons, to the Austin Co.

Lion Brewery, New York, apartment building, Fifth Avenue and Eightieth Street, New York, 500 tons, to New York Shipbuilding & Dry Dock Co.

Apartment building, West-Ninety-sixth Street, New York, 1000 tons, to Hinkle Iron Co.

Apartment building, East Fifty-seventh Street, New York, 1000 tons, to Hinkle Iron Co., New York.

Apartment building, Park Avenue and Eightieth Street, New York, 1300 tons, to Hinkle Iron Co., New York.

Apartment building, Park Avenue and Ninety-second Street, New York, 1300 tons, to Paterson Bridge & Iron Works, Paterson, N. J.

Public school No. 101, Forest Hills, Long Island, 1000 tons, to Harris Structural Steel Co., New York.

Union Drawn Steel Co., Beaver Falls, Pa., warehouse building at Hartford, Conn., 110 tons, to Fort Pitt Bridge Works, Pittsburgh.

Pharis Tire & Rubber Co., Newark, Ohio, factory, 120 tons, to Fort Pitt Bridge Works.

High school gymnasium, Waukegan, Ill., 247 tons, to Midland Structural Steel Co.

Starck Piano Co., Chicago, Ill., loft building, 104 tons, to Duffin Iron Co., Chicago.

North Side high school, Fort Wayne, Ind., 250 tons, to Jones & Laughlin Steel Corporation, Pittsburgh.

Insurance building, Indianapolis, Ind., 125 tons, to Robert Berner Structural Steel Co., Indianapolis.

United States Engineers, office building, Louisville, Ky., 750 tons, to American Car & Foundry Co.

The Paraffine Companies, Inc., Emeryville, Cal., 100 tons, to Moore Dry Dock Co., San Francisco.

New Grauman Theater, Hollywood, Cal., 750 tons, to McClintic-Marshall Co.

Hubbard Mfg. Co., Oakland, Cal., 150 tons, to Judson Mfg. Co., San Francisco.

Everett Pulp & Paper Co., Everett, Wash., 450 tons, to Minneapolis Steel & Machinery Co., Minneapolis.
Standard Seamless Tube Co., Economy, Pa., plant extension, 600 tons, to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Loft building, Eighth Avenue and Thirty-eighth Street, New York, 2500 tons.

Manhattan Storage Warehouse Co., New York, Third Avenue and Eightieth Street, 5000 tons.

Apartment building, West Fifty-sixth Street, New York, 1000 tons.

Apartment building, Park Avenue and Ninetieth Street, New York, 800 tons.

Apartment building, Central Park West and Eighty-fourth Street, New York, 500 tons.

Loft building, 316 Broadway, New York, 1000 tons.

Cranleigh Hospital, East Ninetieth Street, New York, 800 tons.

Apartment building, 41 West Ninety-sixth Street, New York, 900 tons.

George A. Fuller Co., New York, club building at Miami, Fla., 1500 tons.

Lehigh Valley Railroad, bridges, 500 tons.

New England-Portland Cement Co., Rockland, Me., building, 150 tons.

Florida East Coast Railroad, bridges, 1200 tons.

West Point, N. Y., building, 2000 tons.

New York Central Lines, bridges, 650 tons.

Hotel, Greensborough, N. C., 800 tons.

Barnett National Bank Building, Jacksonville, Fla., 1000 tons.

Hillman Coal & Coke Co., Pittsburgh, 20 coal barges, 3000 tons.

Island Creek Coal Co., 8 coal barges, 900 tons.

Budd Wheel Co., Detroit, Mich., 2000 tons.

Standard Oil Co., Wood River, Ill., refinery buildings, 650 tons.

Marland Refining Co., Ponca City, Okla., oil storage tanks, tonnage unstated.

Chicago Athletic Club, Chicago, 400 tons.

Gas holders: Allen, Pa., 3000 tons; Lawrence, Mass., 1500 tons; Taunton, Mass., 1000 tons; Toronto, Ont., 1500 tons.

Mangin & Otter, Inc., Eighth and Mission Streets, San Francisco, loft building, 300 tons.

Temple Emanu El, San Francisco, 300 tons.

Los Angeles, City Hall, 7000 tons.

City of Carmichael, Cal., pipe line, 250 to 300 tons.

City of Bend, Ore., pipe line, 850 tons; bids close Nov. 20.

Key System Transit Co., Oakland, Cal., two ferry boats, 1600 to 2000 tons of plates and shapes.

Santa Fe Railroad Co., barge, 700 tons of plates and shapes.

City of Auburn, Wash., pipe line, 300 tons; bids close Nov. 14.

East Bay Water Co., Oakland, Cal., pipe line, 375 tons; bids closed.

Southern California Edison Co., Los Angeles, pipe line, 3000 tons.

RAILROAD EQUIPMENT

Orders for Over 4100 Cars but No Important Fresh Inquiries

Outstanding in the week's developments in the railroad equipment field was the purchase of 4000 freight cars by the St. Louis-San Francisco. No fresh inquiries of importance appeared. The items are as follows:

The Chesapeake & Ohio has placed three postal cars with the Bethlehem Shipbuilding Corporation.

The St. Louis-San Francisco has placed 2000 box cars and 14 passenger coaches with the American Car & Foundry Co., 500 box cars with the General American Car Co., 500 automobile cars each with the Mount Vernon Car Mfg Co. and the Pullman Car & Mfg. Co., and 500 gondolas with the Tennessee Coal, Iron & Railroad Co. The same road will also purchase 15 large Mikado type freight engines and 10 Mountain type passenger engines at an early date.

The Sinclair Refining Co. has ordered 50 10,000-gal. tank cars from the General American Tank Car Corporation.

The Nickel Plate has placed 100 underframes with the Pennsylvania Car Co.

The Industrial Coal Co. has bought 75 mine cars from the American Car & Foundry Co.

The T. F. Quinn Coal Co. has ordered 12 mine cars of the American Car & Foundry Co.

Machinery Markets and News of the Works

OCTOBER BUSINESS GOOD

Large Volume of Inquiry Taken to Forecast Continuance of Buying

French Interests Inquire for Several Large Drills —Twelve Tools Wanted by Airplane Maker

"One of the best months of the year," or "the best month of the year," are expressions from most centers as to the volume of business done in machine tools in October. Although in some important districts sales fell off somewhat during the past week, the volume of inquiry has been large, which is taken to forecast active business during November or the months immediately following.

Production continues at a comparatively high rate and many builders are increasing their shop forces to meet delivery requirements.

There has been a slowing down in buying by the automotive industry. Railroad purchases are not ex-

tensive, but it is expected that during the next month the Norfolk & Western will place orders against its list.

The Wright Aeronautical Corporation of America, Paterson, N. J., has issued a list for 12 tools, including lathes, milling machines, centerless and other grinders.

In addition to equipment recently purchased, the Nash Motors Co. is said to be in the market for turret lathes, which equipment, together with milling machines, is being inquired for also by the Yellow Coach Mfg. Co. The Yellow Sleeve Valve Engine Works is inquiring for additional equipment, and the International Harvester Co. is in the market for tools for its tractor and bus plants.

An important inquiry before the trade is for approximately 20 large drilling machines for shipment to France.

Increased demand for punching and shearing equipment is noted, one large order placed recently being that of the Youngstown Sheet & Tube Co., for 30 shears. A gate shear and punch are among equipment purchases contemplated by the St. Joseph Structural Steel Co., St. Joseph, Mo.

New York

NEW YORK, Nov. 2.

ALTHOUGH most of the current inquiry for machine tools is confined to requests for prices on single machines, the number of inquiries in hand is increasing daily with purchasing keeping pace. Among recent inquiries is a list of about a dozen tools including lathes, milling machines and drill presses from the Wright Aeronautical Corporation of America, Paterson, N. J. The greater part of the current demand is from small manufacturers and automatic machinery is a feature of these inquiries. Recent single tool sales include automatic lathes, automatic milling machines, automatic centering machines, centerless grinders, vertical surface grinders and jig borers.

Industrial rather than railroad demand has been prominent in reports of recent sales. B. F. Perkins & Sons, Holyoke, Mass., have closed on a 36-in. x 36-ft. engine lathe with the Niles-Bement-Pond Co. The A. O. Smith Corporation, Milwaukee, has purchased an 84-in. vertical boring and turning mill and the Champion Coated Paper Co., Hamilton, Ohio, eight 150-hp. Maag reduction units from the same company. The Delco Light Co., Dayton, Ohio, has purchased six automatic lathes and the Chrysler Motor Corporation, two automatic lathes and one automatic centering machine.

Work will begin on a one-story machine shop at the locomotive repair plant of the New York Central Railroad Co. at Toledo, Ohio, for which a general contract has been let to the H. K. Ferguson Co., Cleveland. Several cranes will be installed.

The United States Gypsum Co., 205 West Monroe Street, Chicago, is said to have preliminary plans under way for a new plant on block bounded by 135th and 136th Streets, Locust Avenue and the East River, New York, to cost more than \$200,000 with equipment. L. V. Ayres is chief engineer.

The Michigan Artificial Ice Products Co., Hudson, N. Y., George Levey, president and general manager, has plans for a three-story ice-manufacturing plant, 95 x 125 ft., to cost \$120,000 with machinery.

The Board of Transportation, City of New York, 49 Lafayette Street, has received a low bid from the P. J. Carlin Construction Co., Grand Central Terminal, for

buildings for main repair shops at the municipal railroad yards, Avenue X and Shell Road, Coney Island, at a price of \$1,700,000.

The Culver Tinsmith & Supply Co., 1233 Thirty-ninth Street, Brooklyn, has plans for a one-story metal-working shop, 40 x 91 ft., at 1104-10 Thirty-ninth Street.

Fire, Oct. 24, damaged a portion of the machinery and fixtures at the plant of the Centre Lighting Fixture Mfg. Co., 133-95 Mercer Street, New York.

The Tide Water Oil Co., 11 Broadway, New York, is disposing of a preferred stock issue of \$25,221,500, a portion of the proceeds to be used in connection with a proposed expansion program for refineries, by-products plants, and storage and distributing works. The main refinery of the company is at Bayonne, N. J. Axtell J. Byles is president.

The Queens Sash & Door Co., Inc., 29 Rockaway Road, Jamaica, L. I., has plans for a new one-story plant, 45 x 137 ft., to cost \$32,000. D. J. Levinson, Jamaica Avenue, is architect.

The Jersey Central Power & Light Co., Morristown, N. J., will issue preferred stock in amount of \$2,136,000, of which \$1,000,000 will be disposed of at an early date, a portion of the proceeds to be used for extensions in power plants and system.

The Franklin Motor Co., 65 West Pallsade Avenue, Englewood, N. J., local representative for the Franklin motor car, has plans for a one and two-story service, repair and garage building 50 x 130 ft., to cost approximately \$40,000. Stasse & Barnes, 175 Fifth Avenue, New York, are architects.

The Lawson Aircraft Co., 1819 Broadway, New York, has leased the former plant of the Standard Aero Co., Plainfield, N. J., and will remodel for a new plant. Alfred W. Lawson is one of the heads of the company.

The Newark Wire Works, 676 South Fourteenth Street, Newark, N. J., has awarded a general contract to the Fatzler Co., South Sixteenth Street, for a one-story addition, 32 x 80 ft., for which plans were drawn by A. M. Kleeman, 987 Springfield Avenue, Irvington, architect.

The Public Service Transportation Co., Public Service Terminal Building, Newark, will install a machine and motor bus repair shop in its new service and garage building now in course of erection. It will have facilities for handling 140 buses.

The Warren Mfg. Co., 342 Madison Avenue, New York, manufacturer of paper products, has work under way on a one-story addition to its mill at Milford, N. J., 80 x 112 ft., to cost \$35,000. George Bidwell is plant superintendent.

The Crane Market

FEW new inquiries of any size have appeared in the overhead field, but the closing of lists that have been pending for some time has rendered the market fairly active. The Anaconda Copper Mining Co. has closed on its cranes for domestic use and the Andes Copper Mining Co. has purchased its five cranes for Chile, leaving a total of 17 overhead cranes to be purchased for export to Chile by the Andes Copper Mining Co. No action has been taken on the three gantry cranes for the Delaware, Lackawanna & Western. The Lehigh Valley Railroad, in the market for several months for an overhead traveling crane, will probably not purchase until after settlement of the coal strike. The General Electric Co., Schenectady, N. Y., has cancelled its inquiry for two overhead cranes for Buffalo, N. Y., but is about to close on the 10-ton crane for Schenectady and still has two 2-ton cranes to be purchased for West Philadelphia. The 30-ton gantry crane for which the Phoenix Utility Co., 71 Broadway, New York, has been in the market will not be purchased at present as a result of the revolution in Ecuador. The Mobile Steel Co., Mobile, Ala., is interested in purchasing a 3 to 4-ton electric locomotive crane.

Among recent purchases are:

Anaconda Copper Mining Co., New York, two 20-ton and

two 10-ton overhead cranes for domestic installation from the Whiting Corporation.

Chile Exploration Co., New York, one 100-ton, three 30-ton and one 20-ton overhead cranes for export to Chile, from the Morgan Engineering Co.

Phoenix Utility Co., 71 Broadway, New York, a 30-ton locomotive crane for use in Florida, from the Ohio Locomotive Crane Co.

Shupe Terminal Co., Kearny, N. J., a 20-ton locomotive crane from the Ohio Locomotive Crane Co.

Acme Steel Erection Co., New York, a 40-ton used Industrial locomotive crane for Germyn, Va., from Philip T. King, New York.

Ford, Bacon & Davis, New York, a 100-ft. bucket handling crane for the Nazareth Cement Co., Nazareth, Pa., reported purchased from the Cleveland Crane & Engineering Co.

Edward G. Budd Mfg. Co., Philadelphia, a 5-ton trolley from the Niles-Bement-Pond Co.

Consolidated Mining & Smelting Co., Toronto, Ont., a 15-ton trolley from the Niles-Bement-Pond Co.

M. A. Long Co., Baltimore, recently in the market for a 20-ton locomotive crane has purchased a used machine.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, has awarded a general contract to J. W. Ferguson, 40 West Fortieth Street, New York, for a four-story factory branch and distributing plant, 98 x 372 ft., at Newark, N. J., to cost \$250,000. Walter S. Timmis, 315 Fifth Avenue, New York, is architect.

The United States Toy Co., Newark, has leased a portion of the building at 86 Shipman Street, for a local plant.

The Morris Machinery Co., 99 Chestnut Street, Newark, has purchased a factory, 60 x 200 ft., at 43-45 Oliver Street, and will occupy for a new plant. Improvements will be made.

The Jenkins Mfg. Co., 35 Farrand Street, Bloomfield, N. J., to meet the demand for its new line of red brass pipe fittings and unions, is erecting a one-story sawtooth foundry addition, which with new electric furnace equipment will increase capacity in this department, it is stated, about 500,000 lb. per year. Walter Kidde & Co., Inc., New York, is the engineering and constructing concern in charge.

Chicago

CHICAGO, Nov. 2.

LOCAL machine tool dealers find after having balanced their books for the month just passed, that October buying was in somewhat better volume than that of September. Inquiries have also been well sustained. Deliveries have not improved; in fact, several types of machines are now being booked for delivery during the first two weeks in January. The announcement that the tools and equipment of the Midwest Engine Co., Indianapolis, Ind., are to be sold at auction has caused some little apprehension in the trade. Many of these machine tools are comparatively new and were purchased for the purpose of manufacturing tractor engines.

It is now understood that the Nash Motors Co., Kenosha, Wis., closed for a part of \$50,000 worth of crank lathes, for which it was reported in the market last week, and that probably more than \$30,000 worth of grinding machines have been ordered. It is also said to be in the market for a number of turret lathes. The Yellow Coach Mfg. Co., Chicago, is inquiring for milling machines and turret lathes and the Yellow Sleeve Valve Engine Works, East Moline, Ill., is also interested in additional machine tools. The A. O. Smith Corporation, Milwaukee, has bought a few scattered tools, including several drilling machines. That company has not withdrawn from the market, still being interested, it is said, in additional milling equipment. The International Harvester Co., Chicago, has bought two 4-ft. radial drills and is inquiring for tools to be used in its various tractor and bus manufacturing plants. The list for the Palmer House, a new Chicago hotel, has been closed, and the Florida East Coast list is being actively worked on.

The city of Chicago has an inquiry out for a 15-in. lathe and a 25-in. drill press. The St. Joseph Structural Steel Co., St. Joseph, Mo., contemplates the purchase of a gate shear for plates 48 in. wide x $\frac{3}{4}$ in. thick, a $1\frac{1}{2}$ and a 2-ton electric hoist, and an architectural type of punch with a throat 12 in. deep to punch $\frac{3}{4}$ -in. diameter holes through $\frac{3}{4}$ -in. metal.

The Interstate Public Service Co., Vincennes, Ind., has work under way on the enlargement and improvement of its plant at Edwardsport, Ind., to cost more than \$150,000.

The Great Western Sugar Co., Sugar Building, Denver, Colo., plans the construction of a power plant at its Minatar, Neb., beet sugar mill. The cost, with machinery, will be approximately \$1,500,000.

The Knife River Coal Mining Co., Beulah, N. D., will rebuild a portion of its power house and mining plant recently destroyed by fire with loss of approximately \$100,000.

The Chicago, Burlington & Quincy Railroad is contemplating the expenditure of approximately \$60,000 for an addition to its steel car plant at Galesburg, Ill.

The Arkansas Foundry Co., Little Rock, Ark., is erecting a steel addition to its foundry and is in the market for molding machines, cupola and sand blast equipment. It also is inquiring for a used steel building, approximately 60 x 150 ft., 20 ft. high.

The Binks Spray Equipment Co., 3130 Carroll Avenue, Chicago, manufacturer of spraying and washing machinery, is arranging for extensions in its two-story plant to cost about \$19,000. Arthur B. Maiworm, 1100 North Boulevard, Oak Park, Ill., is architect.

James Marz, 5413 Winthrop Street, Chicago, has plans for a two-story and basement automobile service, repair and garage building, 100 x 150 ft., to cost \$150,000 with equipment.

The Klauer Mfg. Co., Ninth and Washington Streets, Dubuque, Iowa, manufacturer of sheet metal ceilings and kindred products, is contemplating the erection of a new plant on Iowa Street.

The Lennox Furnace Co., Marshalltown, Iowa, has awarded a general contract to Leon Will, Marshalltown, for a one-story addition, 80 x 100 ft., to cost approximately \$30,000 with equipment.

The Interstate Power Co., Dubuque, Iowa, operating the Dubuque Electric Co. and other public utilities, has plans for an addition to its steam-operated electric generating station, to cost about \$500,000 with machinery. H. C. Orton is vice-president.

The Illinois Cooperage Mfg. Co., 220 South State Street, Chicago, has awarded a general contract to Steinhardt & Cooper, Blue Island, Ill., for a new one-story mill, 135 x 150 ft., with power house, at Blue Island, to cost \$65,000. Buckley & Skidmore, Hammond Building, Hammond, Ind., are architects.

The Martin Mfg. Co., Oak Hill, St. Louis Park, Minn., is considering rebuilding the portion of its foundry recently destroyed by fire, with loss reported at \$25,000 including equipment. W. P. Martin is president.

The Englewood Overland Co., 5952 South Halsted Street, Chicago, local representative for the Overland automobile, has preliminary plans for a one-story and basement service, repair and garage building, 100 x 140 ft., to cost \$100,000 including equipment. Homer G. Sailor, 718 West Sixty-third Street, is architect.

The Holly Sugar Co., Kittredge Building, Denver, Colo., has plans for a new beet sugar refinery at Torrington, Wyo., including power house and machine shop, to cost close to \$1,300,000 with machinery.

The Packard Motor Car Co. of Chicago, 2357 South Michigan Avenue, Chicago, has awarded a general contract to the H. F. Friedstedt Co., 431 North Michigan Avenue, for a two-story and basement service, repair and garage building at Evanston, Ill., to cost approximately \$150,000.

The Ziv Steel & Wire Co., 4423 Kinzie Street, Chicago, has awarded a general contract to A. B. Larson, 19 South La Salle Street, for a one- and two-story storage and distributing plant, 75 x 130 ft., to cost \$55,000. Frank D. Chase, Inc., 720 North Michigan Avenue, is architect and engineer. Aaron Ziv is president.

New England

Boston, Nov. 2.

OCTOBER ended with a fresh buying movement in machine tools. Business was confined to comparatively few houses, however, and considerably more used tools were sold than new. Sales consisted of a wide variety of equipment and included several automatic screw machines, power presses, milling machines, grinders, lathes, radial and upright drills. A central Massachusetts machinery maker bought several grinding machines and other equipment, but most of the buying has been of single tools. New inquiries are increasing, particularly for production equipment. In addition, New York State dealers are inquiring for internal grinders, herringbone gear cutters, Blanchard grinders, alligator shears, Warner & Swasey turret lathes and other used equipment.

The Hunt-Spiller Mfg. Corporation, 383 Dorchester Avenue, South Boston, has awarded contract for a 42 x 92 ft. power house.

The New England Smelting Co., 220 Union Street, West Springfield, Mass., will erect an addition to cost \$30,000. John W. Donahue, 105 Bridge Street, Springfield, is the architect.

Bids close Nov. 7 on a nine-story and basement, 75 x 170 ft. blade manufacturing plant and a nine-story and basement, 75 x 152 ft. razor handle manufacturing plant for the Gillette Safety Razor Co., South Boston. Charles T. Main, 200 Devonshire Street, Boston, is engineer for the blade plant and Monks & Johnson, 99 Chauncy Street, is engineer for the handle plant.

Plans have been filed by the Hood Rubber Co., Watertown, Mass., manufacturer of automobile tires, etc., for additions to buildings Nos. 51, 52 and 53 to cost \$80,000.

A new corporation, recent purchaser of the plant and business of the New Home Sewing Machine Co., Orange, Mass., has taken over the property from the receiver, Charles N. Stoddard, and has plans for developing to a capacity basis at an early date. Improvements and replacements will be made in equipment.

The Skayef Ball Bearing Co., New Park Avenue, Hartford, Conn., has awarded a general contract to the Imperial Construction Co., 721 Main Street, for a one-story addition, 75 x 96 ft.

The Underhill Brothers Tool Co., Cummins Street, Somerville, Mass., will rebuild the portion of its plant recently destroyed by fire and will replace equipment.

The Stamford Water Co., Stamford, Conn., has filed plans for a two-story machine and repair shop, 42 x 67 ft., and one-story service and garage building, 25 x 88 ft., to cost \$35,000. Butler & Provoost, Stamford, are architects.

Thomas McGrath, Providence, R. I., manufacturing jeweler, has awarded contract to the Famiglietti Construction Co., 359 Charles Street, for a new two-story factory, 60 x 100 ft., to cost \$30,000.

Fire, Oct. 26, damaged a portion of the plant of the LeBaron Foundry Co., Brockton, Mass., with loss reported at \$13,000.

The Fafnir Bearing Co., New Britain, Conn., manufacturer of ball bearings, etc., has superstructure in progress on a five-story addition, estimated to cost \$120,000. It is purposed to have the structure ready for the machinery installation early in the coming year.

The Mack Motor Haulage Co., 673 Connecticut Avenue, Bridgeport, Conn., will soon ask bids for a one-story service, repair and garage building, totaling about 35,000 sq. ft., to cost \$150,000, with equipment. The Warren Engineering Co., Boston, is engineer.

The Patent Button Co., 41 Brown Street, Waterbury, Conn., has plans for a power house, 33 x 45 ft., at its new factory now in course of building. Westcott & Mapes, Inc., New Haven, Conn., are architects and engineers.

Milwaukee

MILWAUKEE, Nov. 2.

OCTOBER has been one of the best months this year with respect to the volume of machine tools sales and other equipment. Local tool builders enter November with order books in the best shape since the beginning of the year and more men at work than in eighteen months past. Added to the general demand from other centers of the industry is a relatively excellent local call for equipment.

The A. O. Smith Corporation, Milwaukee, which has under construction an addition, known as project No. 51, 180 x 520 ft., to be used for the production of gasoline cracking stills, oil line couplings and similar welded products, has let contracts for building No. 52, of approximately equal size. This will be used for further development of the automobile frame and axle housing division, and will be 160 x 560 ft. While orders have been placed for very large requirements of equipment, much more remains to be purchased. The two projects call for an investment of between \$500,000 and \$750,000 in buildings and machinery. Lloyd R. Smith is president and general manager.

The Crucible Steel Casting Co., 612 Clinton Street, Milwaukee, is breaking ground for its new plant along the Chicago & North Western tracks, between Eleventh and Fifteenth Avenues, to cost about \$450,000. The main foundry will be 135 x 385 ft., and was designed by the H. K. Ferguson Co. Upon completion, the present plant on Clinton Street will be disposed of. Albert C. Lange is president and general manager.

The South Side Malleable Casting Co., Milwaukee, of which Walter W. Lange is president and general manager, is completing a foundry addition, 177 x 186 ft., at Fourteenth and Windlake Avenues, at a cost of about \$90,000.

The Aluminum Goods Mfg. Co., Manitowoc, Wis., has let the general contract to W. W. Oefflein, Inc., 86 Michigan Street, Milwaukee, for the construction of a five-story extension, 140 x 150 ft., to its branch production center at Two Rivers, Wis. The engineers are Lockwood, Green & Co., Chicago. With machinery and other equipment, the project will cost about \$250,000.

The Kohler Co., Kohler, Wis., manufacturer of enameled sanitary ware, etc., has plans by Brust & Philipp, architects, 405 Broadway, Milwaukee, for a new brass foundry, 83 x 202 ft., and will let construction contracts immediately. The work will cost about \$75,000, including electric melting equipment and other machinery. Walter J. Kohler is president and general manager.

The Fox River Paper Co., Appleton, Wis., will invest \$50,000 to \$60,000 in the construction and equipment of a filter house and machine shop, 80 x 105 ft., 30 ft. high, and has placed the general contract with the C. R. Meyer & Sons Co., 50 State Street, Oshkosh, Wis. The shop will require general equipment for servicing the entire mill. E. L. Small is chief engineer.

The Wisconsin Electrical Mfg. Co., 453 East Water Street, Milwaukee, is awarding contracts for a new plant at 1101-1105 Clybourn Street. It will be 40 x 30 x 110 ft., one story and part basement to cost \$35,000. W. H. Fernholz is president and general manager.

The Martin Estate, Frank C. Courtenay, trustee, Iron Block, Milwaukee, will build a three-story automotive headquarters and service building, 60 x 120 ft., at 558-560 Jackson Street, Milwaukee, for the Osmond Jordan Co., now at 182-184 Sixth Street. The work is in charge of Barkhausen & Logemann, architects, 79 Wisconsin Street, local. It will cost about \$75,000 completely equipped.

The Koehring Corporation, 3100 Concordia Avenue, Milwaukee, manufacturer of concrete mixers, paving outfits, contractors' hoists, etc., let the general contract to the Milwaukee Bridge Co. for building a brick and steel storage building, 66 x 300 ft., which will require one or two cranes and some other equipment.

The Tures Mfg. Co., 392-394 Sixth Street, Milwaukee, suffered a loss by fire in its plant on Oct. 26 and practically all equipment was ruined. The company manufactures gasoline lighting systems and fixtures, electrical fixtures and appliances. It is planned to re-establish the plant immediately. Richard Schomberg is president.

The Western Printing & Lithographing Co., Racine, Wis., operating several plants in Racine, has acquired three acres at Mound and Liberty Streets and the Chicago & North Western tracks and will build a new plant at an estimated cost of \$125,000, thus concentrating all activities.

The George J. Meyer Mfg. Co., 576 Clinton Street, Milwaukee, manufacturer of bottling machinery, will build an additional story, 42 x 140 and 34 x 100 ft., on its present five-story main works. The general contractor is Charles B. Danielson. George J. Meyer is president and general manager.

The Common Council, Menasha, Wis., has accepted the bid of Anton Nielsen & Son, Neenah, for building a municipal garage and service station, tool house and storage building for city vehicles, machinery and equipment. The shop fixtures and tools will be purchased shortly. McMahon & Clark, Menasha, are the consulting engineers.

The Board of Industrial Education, Oshkosh, Wis., has accepted the bids of the C. R. Meyer & Sons Co., local, to build the new vocational school and recreation building, designed by Auler & Jensen, local architects, and estimated to cost \$325,000 complete. R. K. Schriber is president of the board.

Cleveland

CLEVELAND, Nov. 2.

BUSINESS in some lines of machinery is keeping up to recent volume, but in other lines there has been a little slowing down the past week or two, which is attributed to the reduced buying by the automotive industry. October, with some local dealers, was as good as previous months, but orders booked by others last month showed a falling off because their volume did not keep up the last two weeks. A local manufacturer of turret lathes sold more machinery in October than in any previous month of the year. These were all in single machine orders or in small lots. Manufacturers of shearing and punching machinery report an improvement in demand from structural shops. Sales during the week included six presses purchased by the Remy Electric Co., Anderson, Ind. Used machinery is moving well.

There is considerable talk of price advances on machine tools. Some manufacturers outside of the Cleveland district report an increase in labor costs and the cost of material also shows a slight upward tendency. This is expected to become more noticeable after the first of the year. Orders for machine tools for delivery in five or six months are being taken and some in the trade feel that they should have better prices to give them further protection against advancing costs on machinery sold for extended delivery.

The Wellman-Seaver-Morgan Co., Cleveland, has taken three special ore handling bridges for the Anglo-Chilean Consolidated Nitrate Corporation and two revolving car dumpers for the Chile Exploration Co. The Streine Tool & Mfg. Co., New Bremen, Ohio, booked an order for 30 electrically driven shears covering the entire shearing equipment for the new Indiana Harbor tin plate plant of the Youngstown Sheet & Tube Co.

The Akron Standard Mold Machine Co., Akron, Ohio, has awarded a contract for a one-story machine shop at an estimated cost of \$50,000.

The Alliance Steel Products Co., Alliance, Ohio, which was recently organized and is building a plant, has elected David Kendall president; Homer Kendall, vice-president and P. S. Bottomley, treasurer.

The Vitreous Enameling Co., Mansfield, Ohio, plans the construction of a \$40,000 addition to its factory.

The Union Malleable Mfg. Co., Cleveland, with capital of \$50,000 will manufacture a line of malleable iron fittings for water, gas, oil or compressed air pipe. The plant of the company has been completed.

Indiana

INDIANAPOLIS, Nov. 2.

THE Cummings Engine Co., Columbus, Ind., has acquired 14 acres in the northern section of the city as a site for new works. Plans will soon be prepared for initial buildings to aggregate about 20,000 sq. ft. of floor space. The present works will be removed to the new location and additional machinery installed.

The Edwards Valve & Mfg. Co., East Chicago, Ind., has

awarded a general contract to the Austin Co., Chicago, for a one-story addition.

The Lyons Clay Products Co., Brook, Ind., Lawrence Lyons, president, recently organized to manufacture fireproofing products, has tentative plans for a three-story factory 90 x 260 ft., at Center Point, Ind., to cost approximately \$150,000 including machinery. Work will begin early in the coming year.

The Board of Education, 150 North Meridian Street, Indianapolis, plans the installation of a manual training department in its proposed Shortridge North Side high school group, to cost \$2,500,000, for which it is expected to ask bids on a general contract in December. J. Edwin Popf and Woolling, Indiana Pythian Building, are architects.

The Turner Mfg. Co., 112 West Jefferson Street, Kokomo, Ind., has awarded a general contract to E. L. Danner, 116 West Monroe Street, for a one-story addition, 80 x 135 ft., to cost approximately \$30,000 with equipment. The E. E. Dunlap Co., 1125 North Buckeye Street, is architect.

The American Closet Valve Co., Mars Hill, Indianapolis, manufacturer of enameled iron products, plumbing fixtures, etc., is arranging for the removal of a portion of its plant to a new building, 60 x 132 ft., being completed, with the installation of additional equipment. The space left in the former building will be used as a brass foundry. The company also plans for early future expansion, to include an iron foundry. Charles A. Wulf is general manager.

A manual training department will be installed in the two-story school to be erected by the Harrison Township Board of Education, William McQuirk, 321½ Ohio Street, Terre Haute, Ind., trustee, to cost \$130,000, for which bids will soon be asked on a general contract. The Shourds-Stoner Co., Tribune Building, is architect.

The Slagle Radio Co., South Calhoun Street, Fort Wayne, Ind., has tentative plans under consideration for a new factory, work to begin early next year. L. S. Slagle is president.

The Indianapolis Plating Co., 635 Kentucky Avenue, Indianapolis, has awarded a general contract to Murphy & Isenhour, Indianapolis, for a new plant, 60 x 100 ft. The equipment installation is estimated to cost about \$25,000.

Pittsburgh

PITTSBURGH, Nov. 2.

THERE is still a cheerful tone to the local machine tool market. With rising activity in the steel industry, which is attended with advancing prices, the prospect for closing much of the pending business on which quotations have been made is encouraging. The outlook for railroad business also is brighter. In point of sales October was a fairly good month with most dealers, although most of the business was in single tools. Many of these items, however, ran into fairly high value, which helped the month's showing.

Bernard H. Prack, Martin Building, Pittsburgh, architect and engineer, has been engaged by the Conemaugh Iron Works, Blairsville, Pa., to prepare plans for rebuilding the portion of its plant recently destroyed by fire, consisting of a one-story foundry, 130 x 312 ft., and machine shop, 60 x 75 ft., to cost about \$250,000 with equipment. Headquarters are at Latrobe, Pa. The company manufactures enameled iron goods.

The West Penn Power Co., West Penn Building, Pittsburgh, is arranging for a new capital stock issue of \$10,000,000, a portion of the fund to be used for extensions and improvements in power plants and systems.

The City Council, Coraopolis, Pa., is planning a bond issue of \$220,000, the fund to be used for extensions and improvements in the municipal electric light and power plant, including additional equipment.

The Penn Metal Co., 65 Franklin Street, Boston, has awarded a general contract to the Plate Construction Co., Parkersburg, W. Va., for the initial unit of its proposed plant at Parkersburg for the manufacture of metal lath and other metal fireproofing products. The company purposes to construct additional units later for sheet metal specialties.

The Superior Brick & Tile Co., Huntington, W. Va., recently organized with a capital of \$200,000, has acquired the local plant of the Huntington Clay Products Co. Plans are under consideration for extensions and the installation of additional equipment.

E. I. du Pont de Nemours & Co., Wilmington, Del., have work in progress on a new plant in the vicinity of Clinchfield, W. Va., for the manufacture of synthol, a gasoline substitute, to cost in excess of \$400,000 with machinery.

Canada

TORONTO, Nov. 2.

MACHINE tool sales for the month of October show improvement over those for September and it is the general opinion that the demand will continue for the remainder of the year. Orders include practically all lines of tools and are coming from all sections of the Dominion. Used and rebuilt tools are also more active.

The Ditchburn Boats, Ltd., Orillia, Ont., will build an addition to its works to take care of increased business and will require some equipment.

The Oneida Community, Ltd., Niagara Falls, Ont., manufacturer of silver-plated ware, etc., is building a steel and brick addition at a cost of \$100,000.

The Kardex-Rand Co. of Canada has started operations in a plant on Bender Hill, Niagara Falls, Ont., where several machines are now running. It proposes to add additional equipment in the immediate future.

The St. Regis Paper Co. has purchased a site at Cap Rouge, Que., and proposes to start work in the spring on the erection of pulp and paper mills to cost approximately \$3,500,000.

Worthing & Son, 59 Strange Avenue, Toronto, are receiving bids for the erection of a blacksmith shop and will be in the market for equipment.

W. D. Beath & Son, Ltd., 394 Symington Avenue, Toronto, manufacturer of electric hoists, steel drums, etc., will start work immediately on the erection of an addition to its plant.

Financial Notes

A special stockholders' meeting of the Chicago Nipple Mfg. Co., 1966 Southport Avenue, Chicago, has been called for Nov. 9 to vote on the authorization and issuance of 4,500 additional shares of class A stock at \$37.50 a share. Stockholders of class A and B stock and holders of trust certificates of record Oct. 26 will be entitled to subscribe for the new stock at the rate of one share of new stock for each thirteen and two-thirds shares held.

Shareholders of the American Heat Economy Bureau, Inc., Pittsburgh, voted recently to increase capital stock from \$100,000 to \$250,000 and also to declare in addition to the regular preferred dividend a stock dividend of 100 per cent to the holders of common stock as of Oct. 1.

Carl Hartmann, Green Bay, Wis., jobber in machine tools and mill equipment, etc., has filed a voluntary petition in bankruptcy. His liabilities are scheduled at \$309,739 and include several large notes to banks in behalf of a number of manufacturing corporations in which he was extensively interested at Green Bay. Assets of \$312,918 are claimed.

Williams & Janney Co., Muncie, Ind., recently incorporated with \$10,000 capital stock, will deal in industrial equipment and supplies. The company has opened a warehouse with a complete stock of mill supplies and equipment, including belting, bolts, drills, packing, pipe fittings, etc., and also contractors' equipment and supplies, such as mixers, wheelbarrows, shovels, etc. Thomas J. Williams, president, attended Carnegie Institute of Technology and was master mechanic of the Indiana Steel & Wire Co. until a year ago. H. Lester Janney, secretary and treasurer, is a graduate of Purdue University and engaged in the contracting business prior to becoming a county surveyor eight years ago.

The American Engineering Co., Philadelphia, manufacturer of hoists, stokers and other machinery, announces that its interests in Canada have been taken over by the Affiliated Engineering Companies, Ltd., of Montreal. This company has been organized by the merger of the Taylor Stoker Co., Ltd., and the Cleaton Co. (Canada), Ltd., both of Montreal. M. Alpern, president of the American Engineering Co., is chairman of the board of the new company and F. S. B. Heward is president.

The Standard Terrasse Rapid Grinder Corporation, 2 St. Clair Place, New York, has been organized with a capital of \$20,000 to manufacture grinding machinery for floor surfaces. This concern is purchasing some equipment for its plant.

The Pneumatic Drop Hammer Co., 127 Beach Street, Roxbury, Boston, maker of the DaCosta pneumatic lift gravity drop hammer, is increasing its manufacturing space. R. P. Fitzgerald is in charge of the plant.

The Hydro Electric Commission of Ontario, University Avenue, Toronto, is arranging for the erection of a power plant at Alexandra Landing, Ont.

The Canadian General Electric Co., 212 King Street West, Toronto, is preparing plans for an addition to its power plant at Ward Street and Wallace Avenue.

Foreign

BIDS are being asked by the Trade and Produce Officer, New Zealand Government Offices, 415 Strand, London, W.C.2, England, until Jan. 11, 1926, for equipment for the railroad department, Wellington, New Zealand, including machine tools, oil-fired bolt furnaces, fuel oil tanks and other apparatus. Specifications at the office noted.

The Mexican Panuco Oil Co., 40 Wall Street, New York, has arranged for an increase in capital from \$3,000,000 to \$5,000,000, a considerable portion of the proceeds to be used for the development of oil properties in British Guiana, including the installation of machinery, storage and distributing facilities, etc.

The Compania Electro-Siderurgica e Industrial de Valdivia, Santiago, Chile, has acquired a site for a hydroelectric power plant near Valdivia, and contemplates the construction of a station with a capacity of 32,000 hp., to be used in connection with a central steel works in this district. For its concession, the company agrees to operate a plant with capacity of about 50,000 tons of iron and steel products per annum. Further information at the office of the Electrical Equipment Division, Bureau of Foreign and Domestic Commerce, Washington, reference No. 23480.

The American Chamber of Commerce in France, 32 Rue Taitbout, Paris, has received an inquiry (C-3177), from a company at Marseilles in the market for American wire bars, machined wire, etc.

Trade Changes

The Uehling Instrument Co., Paterson, N. J., has appointed the Ernest E. Lee Co., 115 South Dearborn Street, Chicago, to represent it in Northern Illinois and Northern Indiana, in connection with the sale of CO₂ recorders, fuel-waste meters and other power plant instruments.

The Coon De Visser Co., which has been representing the Uehling Instrument Co. for several years in Michigan, has moved from 1772 West Lafayette Boulevard to 2051 West Lafayette Boulevard, Detroit.

The Union Drawn Steel Co., Beaver Falls, Pa. discontinued as of Nov. 1, the warehousing of cold finished steel in the Philadelphia and New York districts. Distribution of the company's products in the Philadelphia district hereafter will be through the established warehouses of Horace T. Potts & Co. and Peter A. Frasse & Co., Inc. In the New York district distribution will be through established warehouses.

The Cap Screw & Nut Co., Eastern agent of the Superior Screw & Bolt Mfg. Co., Cleveland, has removed from 45 Lafayette St., to larger quarters at 290 Hudson St., New York.

The Waukesha Steel Products Co., Waukesha, Wis., has amended its corporate articles to change the company name to the Century Fence Co.

The Consolidated Machine Tool Corporation of America, Rochester, N. Y., announces the appointment of the Brown & Zortman Machinery Co., 327 Second Avenue, Pittsburgh, as its Pittsburgh district sales agent for the Hilles & Jones Co. line of tools. W. H. Connell, Jr., who has handled sales of this line through the Pittsburgh office of the Consolidated Machine Tool Corporation and previously for several years was Pittsburgh district sales agent of Hilles & Jones Co., has joined the Brown & Zortman organization and will continue to handle the line, as manager of the plate metal department.

The Chicago Bridge & Iron Works has opened a Cleveland sales office in Room 963, Union Trust Building, under the direction of George S. Sangdahl, district sales manager. Mr. Sangdahl comes to Cleveland from a similar position in Montreal with the Horton Steel Works, Ltd., a subsidiary of the Chicago Bridge & Iron Works. Associated with Mr. Sangdahl will be A. W. Warren, at the present time in the Chicago office of the company. The Cleveland office will handle a territory covering Ohio, West Virginia, Kentucky east of Frankfort, and New York, Pennsylvania and Maryland west of a north and south line just east of Buffalo. The company manufactures elevated water tanks, large oil storage tanks, floating roofs for oil tanks, high-pressure gas holders, standpipes, penstocks, surge tanks, stacks and steel plate work.

Philadelphia

PHILADELPHIA, Nov. 2.

THE Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has authorized the electrification of its southern division between Philadelphia and Wilmington, Del., including all four main tracks, or about 200 miles of trackage, with the installation of steel poles and other equipment to cost more than \$750,000.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, is arranging for a common stock issue of \$14,634,000, the majority of the proceeds to be used for extensions and improvements, including the completion of the new Richmond generating station on the Delaware River, and for additional power plants, transmission lines, etc. Walter H. Johnson is president.

I. Halpern Brothers & Co., Inc., Hancock and Berks Streets, Philadelphia, metal products, has plans for three one-story buildings for a new plant on Erie Avenue, for which bids will soon be asked on general contract. Edwin L. Rothschild, Bankers' Trust Building, is architect. David Halpern is treasurer.

The Lehigh Coal & Navigation Co., 437 Chestnut Street, Philadelphia, has work in progress on a new coal breaker at its No. 6 colliery at Lansford, Pa., to cost \$350,000.

Bertram Ireland, Guarantee Trust Building, Atlantic City, N. J., architect, has plans under way for a two-story automobile service, repair and garage building, 50 x 140 ft., at Pleasantville, N. J., to cost \$50,000 with equipment.

The Nazareth Cement Co., Nazareth, Pa., has awarded a general contract to the Purrell Engineering & Construction Co., 513 West Jackson Boulevard, Chicago, for a three-story addition, 50 x 70 ft. Ford, Bacon & Davis, Inc., 115 Broadway, New York, is engineer.

A power plant and machine shop will be constructed at the proposed artificial silk mill at Parkersburg, W. Va., by the Viscose Co., Marcus Hook, Pa. The entire project will cost approximately \$8,000,000.

The Keystone Motor Car Co., 170 South Washington Street, Wilkes-Barre, Pa., is asking bids on general contract for a one-story service, repair and garage building, 95 x 120 ft., at Kingston, Pa., to cost approximately \$100,000. L. V. Lacy, 45 Owen Street, Forty Fort, Pa., is architect.

Fire, Oct. 28, destroyed a portion of the coal washery of Allison & Eddy, Tamaqua, Pa., with loss reported at \$25,000 including equipment.

Officials of E. I. du Pont de Nemours & Co., Wilmington, Del., and the National Distillers' Products Corporation, 30 Broad Street, New York, have formed the Eastern Alcohol Corporation, to be owned jointly by both interests. Plans are under way for the construction of a new plant for the manufacture of industrial alcohol, to cost more than \$500,000 with machinery.

Louis Reisman, 420 Spruce Street, Scranton, Pa., architect, is asking bids on a general contract for a three-story automobile service, repair and garage building, 50 x 150 ft., to cost \$90,000 with equipment.

The Slaymaker Mfg. Co., 3271 Woodland Avenue, Philadelphia, has been organized to assemble and sell a patented mechanical flashlight which generates its own current, eliminating the use of a battery. The company is now contracting for the manufacture of parts of the flashlight and will later be in the market for screw machines, stamped metal parts, small coils, reflectors and bulbs.

St. Louis

ST. LOUIS, Nov. 2.

CONTRACT has been let by the Liberty Foundry Co., 5000 Thirty-eighth Street, St. Louis, to the Austin Co., Chicago, for a one and two-story addition, 90 x 160 ft., and 30 x 90 ft., respectively, to cost about \$35,000. W. T. Mellow is vice-president.

The St. Joseph Street Railway Co., St. Joseph, Mo., plans the installation of an automatic power substation in the Lake Contrary district, with machinery estimated to cost \$90,000. A transmission line will be built to cost about \$200,000. S. B. Ireland is general manager.

The Southern Ice & Utilities Co., Halleyville, Okla., will make extensions and improvements in its plant, with the installation of additional equipment to cost \$35,000. S. M. Marrs is general manager.

The Southwestern Sash & Door Co., Joplin, Mo., has authorized plans for a new works to replace a plant re-

cently destroyed by fire. It will cost about \$45,000 with equipment. E. H. Bryan heads the company.

The Continental Oil Co., Continental Oil Building, Denver, Colo., is considering erection of a new storage and distributing plant at Muskogee, Okla., with automobile service and repair building for company motor trucks, to cost \$350,000 with equipment.

The Killark Electric Mfg. Co., 3940 Easton Avenue, St. Louis, has awarded a general contract to the Kenton-Hercules Construction Co., Wainwright Building, for a one-story plant, 142 x 160 ft., to cost approximately \$75,000. It will replace a portion of the works recently destroyed by fire. Edward J. Geisler, De Menil Building, is architect.

The American Ice Co., Spring and Wyandotte Streets, Kansas City, Mo., will erect a two-story addition to its ice-manufacturing plant, 43 x 70 ft. Hans von Unwerth, Finance Building, is engineer.

John Hammitt, Calico Rock, Ark., and associates are planning the construction of a one-story electric power house for local commercial service.

The Board of Education, El Reno, Okla., plans the installation of manual training equipment in its proposed three-story high school to cost \$175,000, for which revised plans are being prepared. New bids will soon be asked. Layton, Hicks & Forsyth, Baniff Building, Oklahoma City, Okla., are architects.

The Grand River Gravel Co., Manhattan Building, Muskogee, Okla., plans the installation of dragline loading equipment, screens and other equipment at its sand and gravel properties at Fort Gibson, Okla.

N. B. Fleming, Bliss Building, Tulsa, Okla., architect, has asked bids on general contract for a four-story automobile service, repair and garage building, 100 x 135 ft., to cost \$140,000 with equipment.

The City Council, Pierce City, Mo., plans the installation of well-pumping machinery in connection with improvements in the municipal waterworks.

Detroit

DETROIT, Nov. 2.

PLANs are being prepared by the Bennett Pump Corporation, Muskegon, Mich., for a one-story addition to total about 10,000 sq. ft. of floor space.

The Packard Motor Car Co., 155 East Grand Boulevard, Detroit, is having plans drawn for a one-story machine shop. Albert Kahn, Inc., Marquette Building, is architect.

The Owosso Ice & Fuel Co., Owosso, Mich., affiliated with the Flint Ice & Fuel Co., Flint, Mich., is arranging for a one-story ice-manufacturing plant, 62 x 115 ft., to cost about \$35,000. The George B. Bright Co., 2615 Twelfth Street, Detroit, is architect and engineer.

The Walker Veneer & Box Works, Inc., Alpena, Mich., has been organized to take over and expand the local plant of the Walker Veneer Works. The new company contemplates immediate enlargements and the installation of additional machinery, a quantity of which will be transferred from the factory of the Hardy Box Co., Bay City, Mich. Thomas and Hiram Hardy head the new organization.

The Robert June Engineering & Management Corporation, 8835 Linwood Avenue, Detroit, has acquired a controlling interest in the Electric Flow Meter Co., Kansas City, Mo., formerly the Hyperbo-Electric Flow Meter Co., Chicago, and will operate in the future. Plans are under way for general expansion. Robert June will become president of the organization and J. M. Naiman, heretofore general manager, will act as vice-president, consulting and chief engineer.

The Kermath Mfg. Co., 5890 Commonwealth Avenue, Detroit, manufacturer of marine engines, parts, etc., has asked bids on a general contract for a two-story addition, 50 x 110 ft. J. H. Gustav Steffens, Architects Building, is architect. J. B. Farr is president.

The Consumers Power Co., Jackson, Mich., has plans for a one-story repair and experimental shop, 57 x 175 ft., to cost about \$40,000 with equipment.

The Marks-Fiske-Zeiger Co., Artillery Avenue and the Michigan Central Railroad, Detroit, iron and steel products, will erect a new storage and distributing plant to total about 30,000 sq. ft. of floor space. Material-handling, conveying and other equipment will be installed.

The Muskegon River Power & Light Co., Big Rapids, Mich., is said to have plans for a hydroelectric generating station on the Muskegon River to cost more than \$600,000.

Permission has been asked for immediate construction of a power dam.

The Monroe Auto Equipment Co., East First Street, Monroe, Mich., has awarded a general contract to J. H. Gratton, Monroe, for rebuilding the portion of its plant recently destroyed by fire, to be 32 x 95 ft.

Buffalo

BUFFALO, Nov. 2

THE Buffalo Freight Terminal & Warehouse Co., Elk and Ohio Streets, Buffalo, has acquired property fronting on the Buffalo River and contemplates the construction of a two-story warehouse and distributing plant, 250 x 1000 ft., to cost \$1,000,000. Elevating, conveying, loading and other machinery will be installed. Thomas H. Hanrahan is president.

The Curtiss Aeroplane & Motor Co., 74 Kail Street, Buffalo, has secured a contract from the British Government for airplane motors, totaling about \$600,000, and will develop its local works to capacity to carry out the order.

Officers of the Empire Milking Machine Co., Rochester, N. Y., have organized a new company of the same name, with capital of \$350,000, to take over and expand the present plant and business. The company recently removed its works from Bloomfield, N. J.

The American Radiator Co., 87 Rano Street, Buffalo, has plans for a one-story addition, to be used for the cleaning of castings.

Officials of the Rand Co., Inc., North Tonawanda, N. Y., manufacturer of filing systems and equipment, have formed a subsidiary under the name of the Rand-Kardex Bureau, Inc., with a capital of \$100,000, to operate in a kindred line of production.

The Gardner Pattern Works, Inc., Wellsville, N. Y., recently organized by James A. Gardner and associates, has plans for the establishment of a factory for the production of mill work and patterns.

The Buffalo Dry Dock Co., 191 Ganson Street, Buffalo, is in the market for a triple drum steam hoisting engine.

William Terece, 1089 Genesee Street, Buffalo, is in the market for electrical spot welding and other welding equipment.

The Niagara Clock Corporation, 36 Laird Street, Buffalo, has awarded a general contract for a one-story concrete factory addition to cost \$10,000.

Cincinnati

CINCINNATI, Nov. 2.

OCTOBER was one of the best months of the year for local machine tool builders and several manufacturers report that sales exceeded those of any previous month. The fact that both large and small builders experienced good business is evidence that a healthy condition exists in this market. An important machine tool manufacturer states that his total sales the past month approximated \$250,000, while another leading plant did a volume of business second only to that in June.

Although sales have fallen off the past week, inquiries are above normal, thereby forecasting an active business during November. However, manufacturers state they are encountering increased difficulty in converting inquiries into orders. Production continues at a high rate and several builders have found it necessary to increase their already large force of employees.

A Detroit automobile maker, who placed an order for 22 drills with a local manufacturer recently, has contracted for nine more machines. The most important inquiry before the trade is for approximately 20 large drills for delivery to a French factory. Railroads are buying little equipment, although it is expected that the Norfolk & Western will make purchases against its list within 30 days.

The Niles-Bement-Pond Co. booked a 90-in. heavy driving wheel lathe for the Florida East Coast Railway and a 48-in., 300-ton wheel press for Briggs & Turivas, Chicago. The Havana Central Railroad bought a 42-in. carwheel borer, a 90-in. driving wheel lathe and an 84-in. tire mill. The Treadwell Engineering Co., Easton, Pa., purchased a 73-in. boring mill and a 30-in. time saver lathe from the Niles-Bement-Pond Co. It is reported that the A. O. Smith Corporation, Milwaukee, bought an 84-in. heavy boring mill. The Boston & Albany ordered a large shaper and the John Steptoe Co. sold a 16-in. shaper in Charleston, S. C. A local

builder booked two lathes each for Philadelphia and St. Louis delivery and also received an order from Chicago for several large lathes.

The Greene Packet Co., Cincinnati, is contemplating construction of a river terminal at Huntington, W. Va., to cost approximately \$50,000. Plans provide for a 60 x 90-ft. building, a floating wharf containing steel storage warehouses and loading cranes. Gordon C. Greene is general manager.

William Lang & Sons, 2128 Patterson Street, Cincinnati, structural steel fabricators and ornamental iron manufacturers, has awarded a general contract to Joseph Neyer, Jr., 1660 Central Avenue, Cincinnati, for a one-story factory and office building, approximately 110 x 180 ft.

The G. A. Gray Co., Cincinnati, has begun the production of planers in its new plant at Woodburn Avenue and the C. L. & N. Railroad. Its offices, now housed in the old structure at Gest and Depot Streets, will be transferred to the new quarters by Nov. 7.

The Shiloh Mfg. Co., Shiloh, Ohio, manufacturer of water-softening equipment, has removed its plant to the Wise-Schieble buildings, rear of 314 East Fifth Street, Dayton, Ohio, where about 3000 sq. ft. of floor space is available. Plans are being arranged for increased production.

The Kentucky & Indiana Terminal Railroad, Louisville, has awarded a general contract to the T. S. Leake Construction Co., Louisville, for a one-story repair shop and adjoining building for general operating service, to cost about \$85,000, with equipment.

J. G. Steinkamp & Brother, Mercantile Library Building, Cincinnati, architect, has plans in preparation for a two-story automobile service, repair and garage building, 98 x 176 ft., at Dayton, Ohio, to cost about \$130,000 with equipment.

The Board of Public Works, Nashville, Tenn., will ask bids in November, for a new pumping plant, with capacity of about 15,000,000 gal. per day, in connection with extensions and improvements in the municipal waterworks to cost \$1,500,000. Alvord, Burdick & Howson, 8 South Dearborn Street, Chicago, are engineers.

The DeHart Machine & Foundry Co., 141 North Third Street, Nashville, Tenn., machinery dealer, is desirous of getting in contact with manufacturers of cast iron hog troughs or steel troughs.

The Monarch Marking System Co., South Torrence Street, Dayton, Ohio, manufacturer of price-marking machinery, has broken ground for a three-story addition, 65 x 108 ft., to cost approximately \$75,000. It will double the present floor space. Schenck & Williams, Mutual Home Building, are architects.

The Board of Education, Louisville, is considering the installation of manual training equipment in its proposed new three-story school to cost \$200,000, for which superstructure will soon be placed under way. J. M. Colley, Audubon Park, Louisville, is architect.

South Atlantic States

BALTIMORE, Nov. 2.

TENTATIVE plans are under consideration by the Monumental Machine Co., 3505 Elliott Street, Baltimore, for a new two-story plant, for which an appropriation of about \$60,000 will be arranged. J. W. Sims is president.

The Taylor-Parker Co., Water Street and Commerce Place, Norfolk, Va., has inquiries out for an electric traveling crane, 40 to 50 ft. span, about 10 tons capacity, a carwheel lathe about 60 in., with 6-ft. centers, belt-driven; one wheel press, about 200 tons capacity, and one oil engine, about 50 hp., Fairbanks type preferred.

The Norfolk & Western Railway Co., Clyde Cocke, purchasing agent, room 351, N. & W. Railway Building, Roanoke, Va., is asking bids until Nov. 11 for 1100 sheets of jacket steel, contract serial AA-380, and 420 cast steel side frames, contract serial AA-381.

The Southern Saw Mill Co., Thomasville, Ga., is in the market for four 150-hp. boilers to operate at 150 lb. working pressure, with accessories.

The Diaomaceous Products Co., Inc., 204 Southern Building, Washington, is planning the installation of machinery on property at Dunkirk, Md., for the development and production of silica deposits, including grinding, sorting, conveying and other apparatus.

The Stoneville Cabinet Co., Stoneville, N. C., is considering plans for an addition to double, approximately, the present capacity, to cost about \$45,000. Charles S. Stone is secretary.

The Magneto & Machine Co., 1031 Cathedral Street, Baltimore, is said to have tentative plans under advisement for a new two-story works.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for a 1000 kw. turbo-generator, three-phase,

60-cycle, 2300 volts, with condenser, switchboard and auxiliary apparatus; also for a 500-kw. turbo-generator, with accessories; electric traveling cranes, 8 to 10-ton capacity, 40 to 50-ft. span, 15 to 20-ton capacity, 30-ft. span, and 3 to 5-ton capacity, 75-ft. span; electrical equipment, including transformers, meters, etc., and one standardized steel building, 100 x 150 ft.

The Kimball-Tyler Co., Inc., 261 South Eighth Street, Baltimore, operating a cooperage works, has awarded a general contract to DeCou & Davis, 6 East Mulberry Street, for a one-story plant, 160 x 200 ft., to cost \$75,000 with equipment. Stahl & Michel, 100 North Liberty Street, are engineers. William G. Tyler is president.

A manual training department will be installed in the new high school to be erected at Camp Hill, Cumberland, Md., for which superstructure will be placed under way at once. It will cost about \$500,000. The Board of Education is in charge.

T. L. Gardner, Leaksville, N. C., and associates are completing plans for the organization of a new company to build and operate a furniture factory to be three-stories, 80 x 200 ft., estimated to cost \$175,000, with equipment. A power house will be built.

Walter Candler, Candler Building, Atlanta, Ga., and associates have plans for a three-story automobile service, repair and garage building, 200 x 250 ft., to cost \$500,000 with equipment.

The Georgia Southern Power Co., Atlanta, Ga., is reported to be planning the construction of a new steam-operated electric generating plant at Dublin, Ga., to cost \$450,000 with machinery. The company recently acquired the Dublin municipal power station.

The Board of Awards, City Hall, Baltimore, is asking bids until Nov. 12 for machinery, equipment, tools and supplies for the Department of Education. Specifications on file at the office of the Board of School Commissioners, Madison and Lafayette Streets.

Gulf States

BIRMINGHAM, Nov. 2.

PLANS are being arranged by the United North & South Oil Co., Luling, Tex., for the complete electrification of its plant, work to include the installation of an electric generating station with initial capacity of 2200 kw. The entire project will cost more than \$175,000 with equipment.

The Continental Flat Glass Co., Shreveport, La., manufacturer of window glass, is considering the rebuilding of the portion of its works at Cedar Grove, La., recently destroyed by fire, with loss estimated at close to \$250,000 including machinery.

The Otis Elevator Co., 210 East Forsyth Street, Jacksonville, Fla., is planning for a one-story parts and repair shop to cost \$25,000 with equipment. Roy A. Benjamin, Bisbee Building, is architect. E. P. Hoffman is local manager.

X. A. Kramer, McComb, Miss., engineer, is desirous of getting in contact with manufacturers of machinery for creosoting plants.

The East Texas Public Service Co., 72 West Adams Street, Chicago, a subsidiary of the Mid-West Utilities Co., has acquired property on South Washington Street, Marshall, Tex., and plans the construction of a one-story ice-manufacturing and cold storage plant to cost \$85,000.

The H. Wetter Mfg. Co., Memphis, Tenn., manufacturer of cast iron pipe and fittings, is pushing construction on its new foundry at Gadsden, Ala., and purposes to have the plant ready for service early in December. It will have an initial production of 1500 tons per month. Henry Wetter is president.

W. A. White, head of the Florida Tropics Development Corporation, Kissimmee, Ala., and associates are interested in a project for the establishment of a plant at Intercoastal City, Fla., to manufacture automobile trucks, buses, parts, etc.

The Standard Lumber Co., Live Oak, Fla., has inquiries out for a 400-kw. engine-generator set with auxiliary equipment.

The Eastern Texas Electric Co., Beaumont, Tex., is considering plans for a one-story steam-operated electric light and power house at Nederland, Tex. It is also proposed to erect an ice-manufacturing plant.

The Packard-Scruggs Motor Co., Fort Worth, Tex., local representative for the Packard automobile, has plans for a two-story service, repair and garage building, with foundations suitable for an additional story later, to cost approximately \$70,000. A. G. Fischer heads the organization.

The Chamber of Commerce, Palmetto, Fla., is at the head of a project to construct and operate a municipal electric

power plant. It is proposed to arrange a bond issue of \$300,000 for this and other city improvements.

The Crane Co., 836 South Michigan Avenue, Chicago, has awarded a general contract to Chalker, Lund & Crittenden, West Palm Beach, Fla., for a new factory branch and distributing plant at West Palm Beach, to cost about \$100,000 with equipment.

The J. M. Card Lumber Co., Rosevale Boulevard, Chattanooga, Tenn., will proceed with the construction of a new mill at Chickasaw, near Mobile, Ala., to cost \$350,000.

Pacific Coast

SAN FRANCISCO, Oct. 28.

THE Percival Iron & Steel Co., 232 Aliso Street, Los Angeles, is having plans drawn for a new one-story machine shop at Vernon, to cost \$150,000 with equipment.

The McCormick Brothers Iron Works, Inc., Main and Folsom Streets, San Francisco, is arranging to rebuild the portion of its plant recently destroyed by fire, with loss reported at \$50,000 including equipment.

The Santee Garage Co., Los Angeles, has completed plans for a six-story service, repair and garage building, 100 x 155 ft., to cost \$350,000 with equipment. Dodge & Burnett, Lankershim Building, are architects.

The Bloedel-Donovan Lumber Co., foot of Cornwall Avenue, Bellingham, Wash., is completing plans for the electrification of its mill, including the installation of a central power house, with turbo-generator and auxiliary equipment, to cost \$75,000. J. J. Donovan is vice-president.

The Board of Works, Pocatello, Idaho, is considering the installation of pumping equipment in connection with proposed extensions in the municipal waterworks to cost \$500,000. The Burns-McDonnell-Smith Engineering Co., Rives-Strong Building, Los Angeles, and Interstate Building, Kansas City, Mo., is engineer.

The Steel Pipe & Tank Co., 1100 Fourth Street, Berkeley, Cal., has awarded a general contract to H. J. Sattin, 2082 University Avenue, for four one-story additions, 120 x 250 ft., 120 x 120 ft., 50 x 260 ft., and 50 x 180 ft.

The Snow Mountain Water & Power Co., San Francisco, operating a hydro-electric power plant in the Potter Valley section, is contemplating two additional stations in the Coyote Valley and at Scott's Dam, northern part of Lake County, to cost \$2,500,000 with transmission systems.

The Solano Iron Works, Inc., Third Street and Allston Way, Berkeley, Cal., has preliminary plans for a new one-story works to cost \$25,000.

The Eureka Paper Box Co., Los Angeles, has plans for a new two-story factory, 65 x 120 ft., to cost \$45,000 with equipment. John M. Cooper, Rives-Strong Building, is architect.

The Mohawk Oil Co., 311 California Street, San Francisco, is completing plans for a new storage and distributing works at the Parr Terminal tract, Oakland, Cal., to cost approximately \$200,000 with equipment.

R. J. Wilson, 1011 West Lee Street, Seattle, has plans for a new machine shop, 36 x 60 ft.

The Chelan Electric Co., Chelan, Wash., is planning the construction of a hydroelectric power house on Lake Chelan, to cost in excess of \$350,000.

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Current Metal Prices

On Small Lots, Delivered from Stocks, New York

THESE prices are given for the convenience of small-lot buyers whose requirements do not run into mill-size orders.

Only base prices can be listed in some cases, due to limits of space; other items of a given group are deducible from the base price.

The prices which are quoted below are those at which small lots may be bought, whether from jobbers' or other stocks.

Complete market reports and prices on large shipments from mills will be found elsewhere under "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
Bars:		
Refined iron bars, base price.....	3.24c.	
Swedish charcoal iron bars, base.....	7.00c. to 7.25c.	
Soft steel bars, base price.....	3.24c.	
Hoops, base price.....	4.49c.	
Bands, base price.....	3.99c.	
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base.....	3.34c.	
Channels, angles and tees under 3 in. x ¼ in. base.....	3.24c.	
Steel plates, ¼ in. and heavier.....	3.34c.	
Merchant Steel		
Tire, 1½ x ½ in. and larger.....	3.30c.	
(Smooth finish, 1 to 2½ x ¼ in. and larger)...	3.65c.	
Toe-calk, ½ x ¾ in. and larger.....	4.20c.	
Cold-rolled strip, soft and quarter hard.....	7.00c.	
Open-hearth spring steel.....	4.50c. to 7.00c.	
Shafting and Screw Stock:		
Rounds and hex.....	4.00c.	
Squares and flats.....	4.50c.	
Standard tool steel, base price.....	15.00c.	
Extra tool steel.....	18.00c.	
Special tool steel.....	23.00c.	
High-speed steel, 18 per cent tungsten.....	70c.	

Sheets		Per Lb.
Blue Annealed		
No. 10.....	3.89c.	
No. 12.....	3.94c.	
No. 14.....	3.99c.	
No. 16.....	4.09c.	
Box Annealed—Black		
	Soft Steel C. R. One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20.....	3.75c. to 3.95c.	.....
Nos. 22 and 24.....	4.00c. to 4.20c.	4.35c.
No. 26.....	4.05c. to 4.25c.	4.40c.
No. 28*	4.15c. to 4.35c.	4.50c.
No. 30.....	4.35c. to 4.55c.	.....

Galvanized		Per Lb.
No. 14.....	4.25c. to 4.45c.	
No. 16.....	4.40c. to 4.60c.	
Nos. 18 and 20.....	4.55c. to 4.75c.	
Nos. 22 and 24.....	4.70c. to 4.90c.	
No. 26.....	4.75c. to 5.05c.	
No. 28*	5.15c. to 5.35c.	
No. 30.....	5.65c. to 5.85c.	

No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Standard Steel		Wrought Iron	
	Black Galv.		Black Galv.
½ in. Butt....	46 29	½ in. Butt....	4 +19
¾ in. Butt....	51 37	¾ in. Butt....	11 + 9
1-3 in. Butt....	53 39	1-1½ in. Butt....	14 + 6
2½-6 in. Lap..	48 35	2-in. Lap....	5 +14
7 & 8 in. Lap..	44 17	3-6 in. Lap....	11 + 6
11 & 12 in. Lap.	37 12	7-12 in. Lap....	3 +16

Bolts and Screws	
Machine bolts, cut thread, 40 and 10 per cent off list	
Carriage bolts, cut thread, 30 and 10 per cent off list	
Coach screws, 40 and 10 per cent off list	
Wood screws, flat head iron,	
80, 20, 10 and 5 per cent off list	

Steel Wire		Per Lb.
BASE PRICE† ON NO. 9 GAGE AND COARSER		
Bright, basic.....	4.10c. to 4.25c.	
Annealed, soft.....	4.35c. to 4.50c.	
Galvanized, annealed.....	5.00c. to 5.15c.	
Coppered, basic.....	5.00c. to 5.15c.	
Tinned, soft Bessemer.....	6.00c. to 6.15c.	

†Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire	
BASE PRICE	
High brass sheet.....	19½c. to 20½c.
High brass wire.....	19½c. to 20½c.
Brass rods.....	17½c. to 18½c.
Brass tube, brazed.....	27½c. to 28½c.
Brass tube, seamless.....	24 c. to 25 c.
Copper tube, seamless.....	25 c. to 26 c.

Copper Sheets	
Sheet copper, hot rolled, 22c. to 23c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates		Coke—14x20	Prime Seconds
Bright Tin	Grade "AAA"	Grade "A"	
	Charcoal 14x20	Charcoal 14x20	
IC..	\$11.25	\$8.85	80 lb...\$6.15 \$5.90
IX..	12.85	10.85	90 lb... 6.30 6.05
IXX..	14.40	12.55	100 lb... 6.45 6.20
IXXX..	15.75	13.85	IC... 6.65 6.40
IXXXX..	17.00	15.05	IX... 7.85 7.60
			IXX... 9.00 8.75
			IXXX... 10.35 10.10
			IXXXX... 11.35 11.10

Terne Plates	
8 lb. coating, 14 x 20	
100 lb.	\$7.00 to \$8.00
IC.....	7.25 to 8.25
IX.....	8.25 to 8.75
Fire-door stock.....	9.00 to 10.00

Tin	
Straits, pig.....	66½c.
Bar.....	69½c. to 71½c.
Copper	
Lake ingot.....	16½c.
Electrolytic.....	16½c.
Casting.....	16 c.

Spelter and Sheet Zinc	
Western spelter.....	10½c.
Sheet zinc, No. 9 base, casks.....	13c.; open, 13½c.

Lead and Solder*	
American pig lead.....	10½c. to 12½c.
Bar lead.....	12½c. to 13½c.
Solder, ½ and ½ guaranteed.....	40½c.
No. 1 solder.....	37½c.
Refined solder.....	31c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal	
Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.....	35c. to 50c.
Grade D, per lb.....	25c. to 35c.

Antimony	
Asiatic.....	21½c. to 22½c.

Aluminum	
No. 1 aluminum (guaranteed over 99 per cent pure), ingots for remelting, per lb... 30½c. to 31½c.	

Old Metals	
The market continues firm. Dealers' buying prices are as follows:	

	Cents Per Lb.
Copper, heavy crucible.....	12.00
Copper, heavy wire.....	11.75
Copper, light bottoms.....	9.50
Brass, heavy.....	7.25
Brass, light.....	6.00
Heavy machine composition.....	9.00
No. 1 yellow brass turnings.....	8.50
No. 1 red brass or composition turnings.....	8.25
Lead, heavy.....	8.00
Lead, tea.....	6.25
Zinc.....	5.50
Cast aluminum.....	19.00
Sheet aluminum.....	19.00

